IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication AUGUST 3, 1961

INDUSTRIAL Products

HOW LONG..

Will the BUYERS' MARKET Last?

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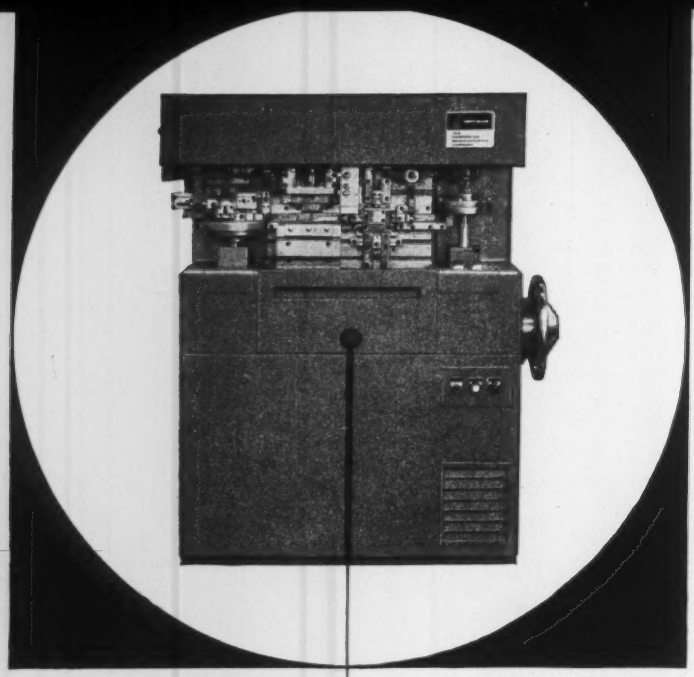
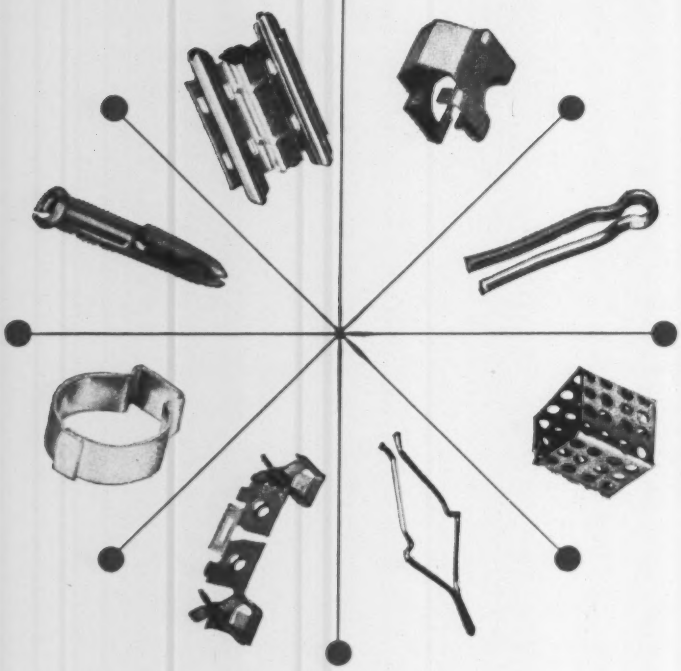


This is the machine **These are its products**



If you recognize parts like these you should be familiar with this machine

The machine is a **Verti-Slide.** It can press, punch, and form in one continuous operation — and in addition, weld, thread roll, swage and do other secondary work. If you now use or supply small parts, made from wire or strip stock, the **Verti-Slide** method can offer you many dramatic production advantages. To evaluate your need write today for our **Parts Cost Package.**

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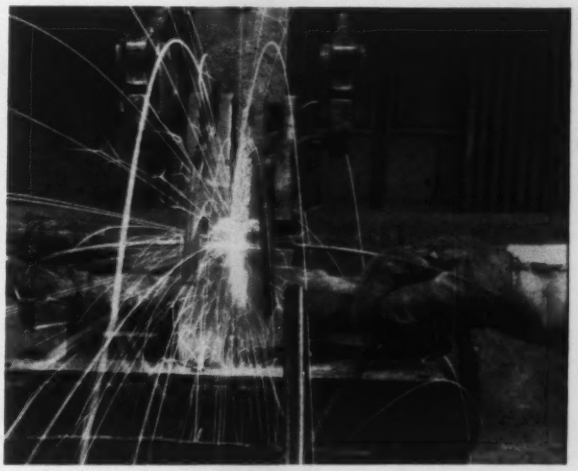
MACHINE DIVISION – TORRINGTON, CONNECTICUT

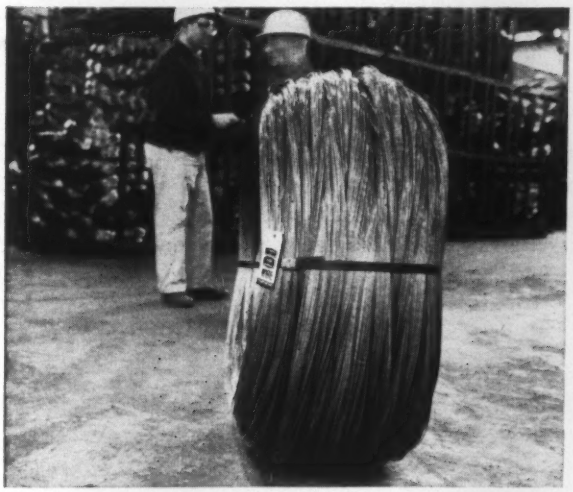
Here's how Bethlehem Wire in heavyweight coils cuts your costs

Bethlehem heavyweight coils, with from 1,000 to 2,000 lb of wire in one continuous length, offer these cost-cutting advantages:

REDUCED MACHINE DOWN-TIME—By using the heavyweight coil, instead of 13 150-lb catchweight coils, you save a maximum of 12 costly machine shutdowns necessary every time you start a standard size coil.



LESS BUTT-WELDING AND COIL REMNANT SCRAP—In operations requiring the welding of coil ends, the time and cost of butt-welding is reduced. And there's less waste in the form of coil remnant scrap.



NO DEPOSITS . . . NO RETURNS—Returnable carriers are not needed with Bethlehem heavyweight coils. Carriers take up valuable storage space, involve extra paperwork, and tie up your cash.

MINIMIZED HANDLING COSTS—One man, operating a fork-lift, crane, or ram truck, can easily handle a heavyweight coil. Speedy unloading. Efficient stacking.

BUNDLED THE WAY YOU WANT THEM—We can supply our heavyweight coils with or without a pallet, for use on welded steel cores (rotating or stationary payoff).

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IRON AGE

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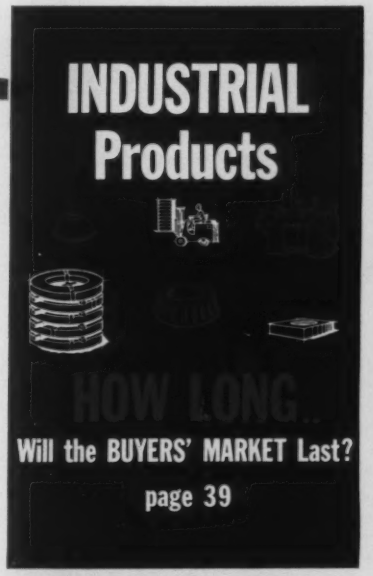


Industrial Prices: Time for a Change?

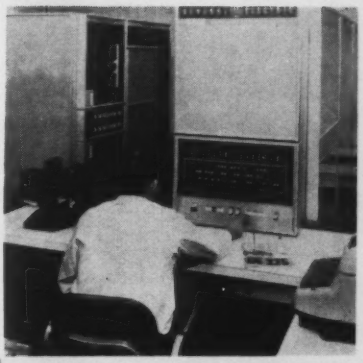
In the first six months of this year industrial products rocked under the greatest downward pressure on prices in the post-war period. The second half of the year shows signs of recovery. This week's cover story analyzes what has happened in the past and what you can expect in the way of price changes. p. 39

Industry Learns Foreign Languages

Businessmen moving abroad are boning up on every detail of their new environments, including one long-ignored aspect: Learning the language of the country they will be doing business in. Industry is stressing this approach more and more. p. 44

Lift the Guesswork Out of Decisions

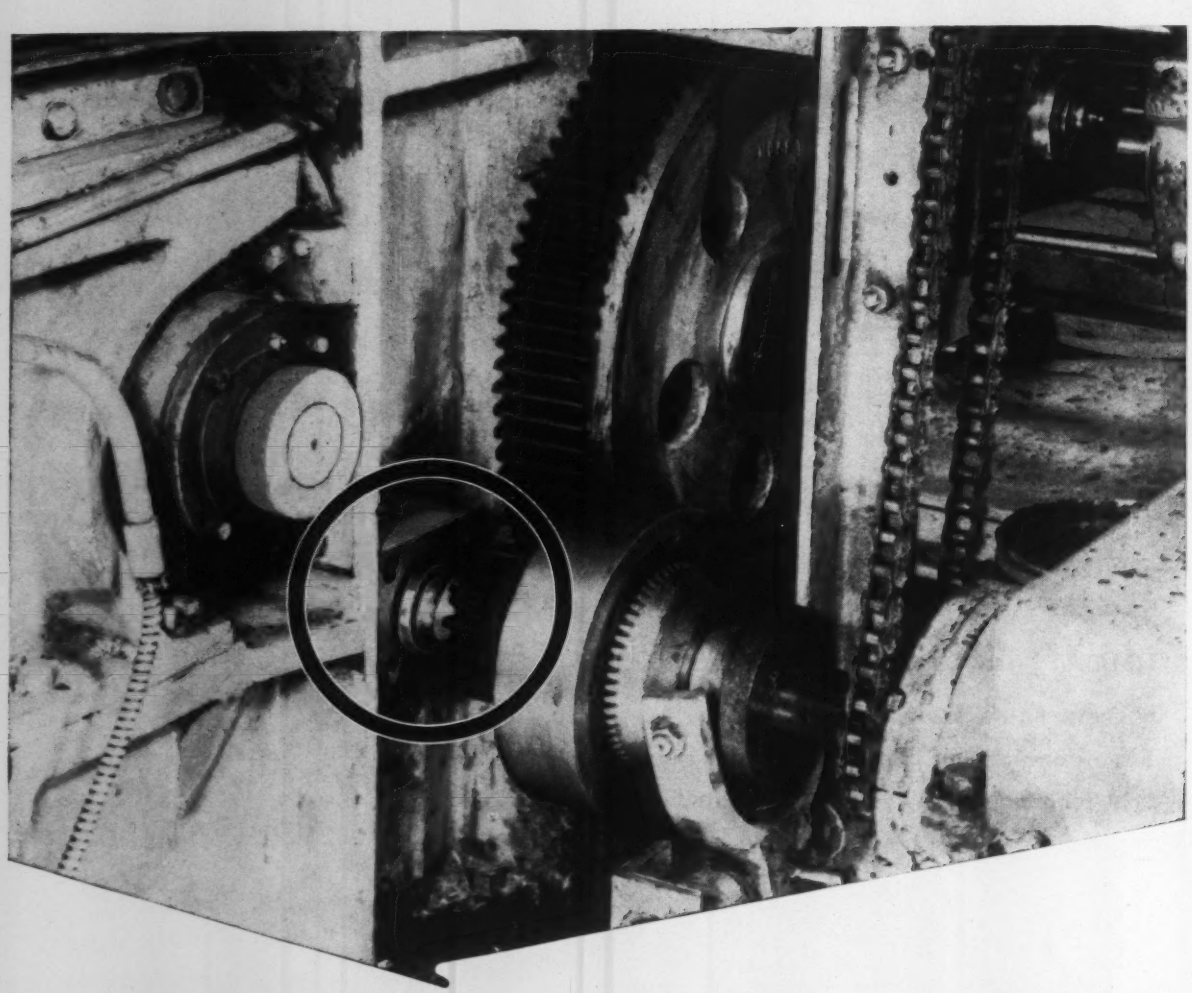
When management makes the big decisions on a project, time and money are at stake. Unfortunately, guesswork often throws these decisions in the wrong direction. Programming, however, offers a real challenge to such hit-or-miss efforts. p. 67



Next Week

Service Takes on Added Stature

Servicing metalworking's customers has taken on a new dimension. For two reasons. One is simple competition. The other is technological; many of metalworking's tools are too complex for shop service. Next week's Special Report analyzes this trend.



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The original bearings on the pinion drive of this corrugating machine had an average life of only three months. Our customer had been advised that only a complete engineering change of machine drive would solve the problem.

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The Die Is Cast: There's No Turning Back!

President Kennedy has made it plain we are willing to risk war to maintain our moral and legal rights in West Berlin. Unless, and until, every citizen knows what this means, the President's job becomes almost unbearable.

Most of us probably are leaving it to the President. As far as we are concerned, he is the public. He is the nation. It is up to him to make the decisions.

Mr. Kennedy's warning that this is only the beginning of a long timetable of events to protect West Berlin—and other free areas—may be forgotten. Most people—like the British who are entering a period of austerity to save their economic lives—have their own worries. These appear to come first.

It will be difficult for Mr. Kennedy to maintain among us the feeling of deep seriousness and responsibility over our international future; at least to the extent that he knows he has our full support. He will have it. But it will not be a demonstrative thing. So the awful burden of proper judgment rests upon the President—even though the burden of accomplishment rests on all of us.

Look at France's plight. Already in the throes of the long and costly Algerian crisis, she now is plunged into a Tunisian abyss. As if that was not enough for our grand alliances, West Germany has her elections with which to contend.

Of course, Mr. Khrushchev has his troubles. But he is a dictator. He can dispatch his critics to limbo if they become too frustrating.

Not so Mr. Kennedy. He will be told time and time again to cut expense in the non-defense field in order to try to meet more adequately the cost of fighting Communism on all fronts. The President will walk alone. He will have to lead. He will have to make the judgments. Only he can weld the nation together to face the awful trials ahead.

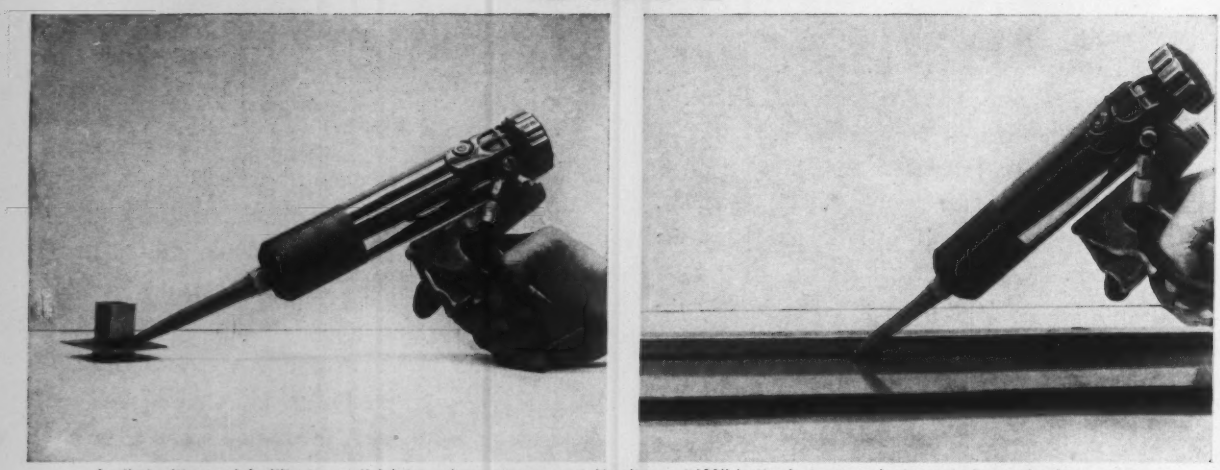
That few seem to realize our country's perils, and to what lengths the Reds will go to make a world of Communism, is beside the point. That is the situation. That is why Mr. Kennedy's actions will determine the final course this nation will take in the life or death struggle with Communism.

The die is cast. There is no turning back. The American character which produced Washington, Tom Paine, Lincoln, and millions of unsung heroes must emerge—before it is too late.

Tom Campbell

Editor-in-Chief

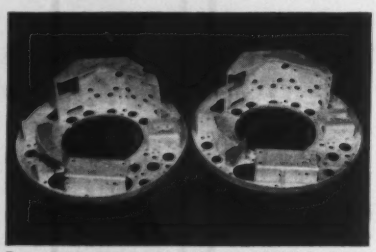
Now- join aluminum with new ease



Applied with equal facility to small joints or large seams, new Alumibraze "400" is the fast, convenient way to braze aluminum parts.

If your work involves joining aluminum alloys, there's a good chance you're already familiar with the advantages of Handy Alumibraze—the salt bath brazing method that provides strong, sound, corrosion-resistant joints—with excellent reproducibility—more readily than preforms—while reducing tool and fixture costs.

Now, Handy & Harman has developed a new preparation—Alumibraze "400"—for even greater ease of application. Containing the same active ingredients as before, Alumibraze "400" is formulated to provide a homogeneous paste that can be extruded onto parts by a gun or other method.



Extrudable Handy Alumibraze "400" is ideal for brazing complex assemblies like these.

Think of the trouble this saves you. You can join extended areas and complicated contours more conveniently than ever before. Cut application and assembly times way down. Reap all the benefits of high-volume production.

Don't let another day go by without learning how Alumibraze "400" can speed operations in your shop. Our recently-expanded Bulletin 23 supplies full details. It's yours for the asking.

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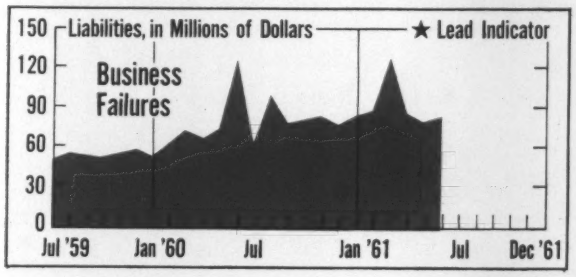
DISTRIBUTORS IN PRINCIPAL CITIES

Business Casualties Decline

Fewer businesses failed in June than in May. But liabilities were greater. Some 1403 companies with



total liabilities of $83.8 million closed shop in June. This compares with 1545 business failures in May with liabilities of $80.5 million.

Failures among manufacturers fell to a 9-month low. The low was partly due to a lessening number of failures in the metals and machinery fields.

The June decline in business failures was about twice the usual seasonal downturn. This is a hopeful sign in the recovery.

Defense Lag: Rail Car Shortage

If President Kennedy's "pre-mobilization" plans go beyond military hardware and manpower, then look for him to give the railroads a nudge—or even help. His own ICC chairman, Everett Hutchinson, has termed the rail freight car shortage "critical."

But current backlogs of car orders amount to less than two weeks work for commercial car builders. And cars are being junked by U.S. roads at twice the replacement rate. Many still in use are termed unfit.

The tipoff to the President's concern in this situation is that 90 pct of all domestic military freight volume in World War II was carried by railroads.

Tight Markets Hold Price Reins

Price increases that might be expected to follow wage increases will have a hard time breaking through.

No immediate price reaction is expected from the pay hike applied August 1 for aluminum workers, for example. General feeling is that producers will delay until September or later before acting on prices. Competitive pressure is still strong.

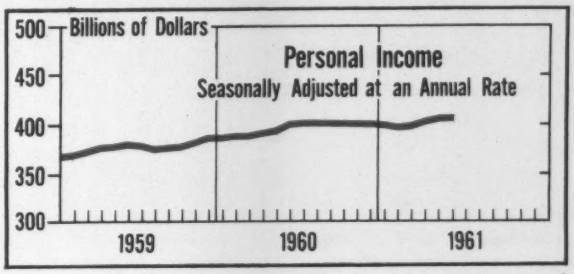
The same circumstances apply in steel. Although the next wage increase is still two months off, most steel men concede that price increases could not hold under present market conditions. This could change by Oct. 1.

Personal Income Sets New High

Personal income in June reached a new high of $416.5 billion, at a seasonally adjusted annual rate. This was $3.5 billion higher than in May, and $13.5 billion above the recession low in February.

With plenty of change jingling in his pocket, the consumer is in good position to spend more. Everywhere he turns there are bargains. Reason: High income with no inflation. Since 1958, per capita disposable income has risen almost 8 pct. Cost of living has gone up less than half of that.

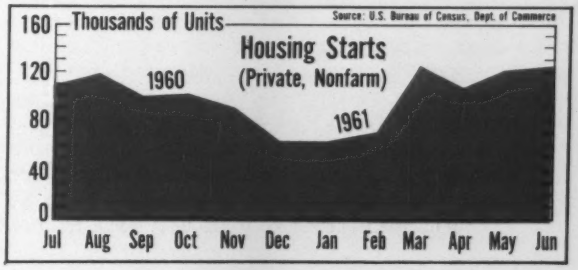
Needed to trigger the spending: Fewer job hunters



on the scene, fewer depressed areas, more backlogs on order books. These are the signs that people see, and talk about.

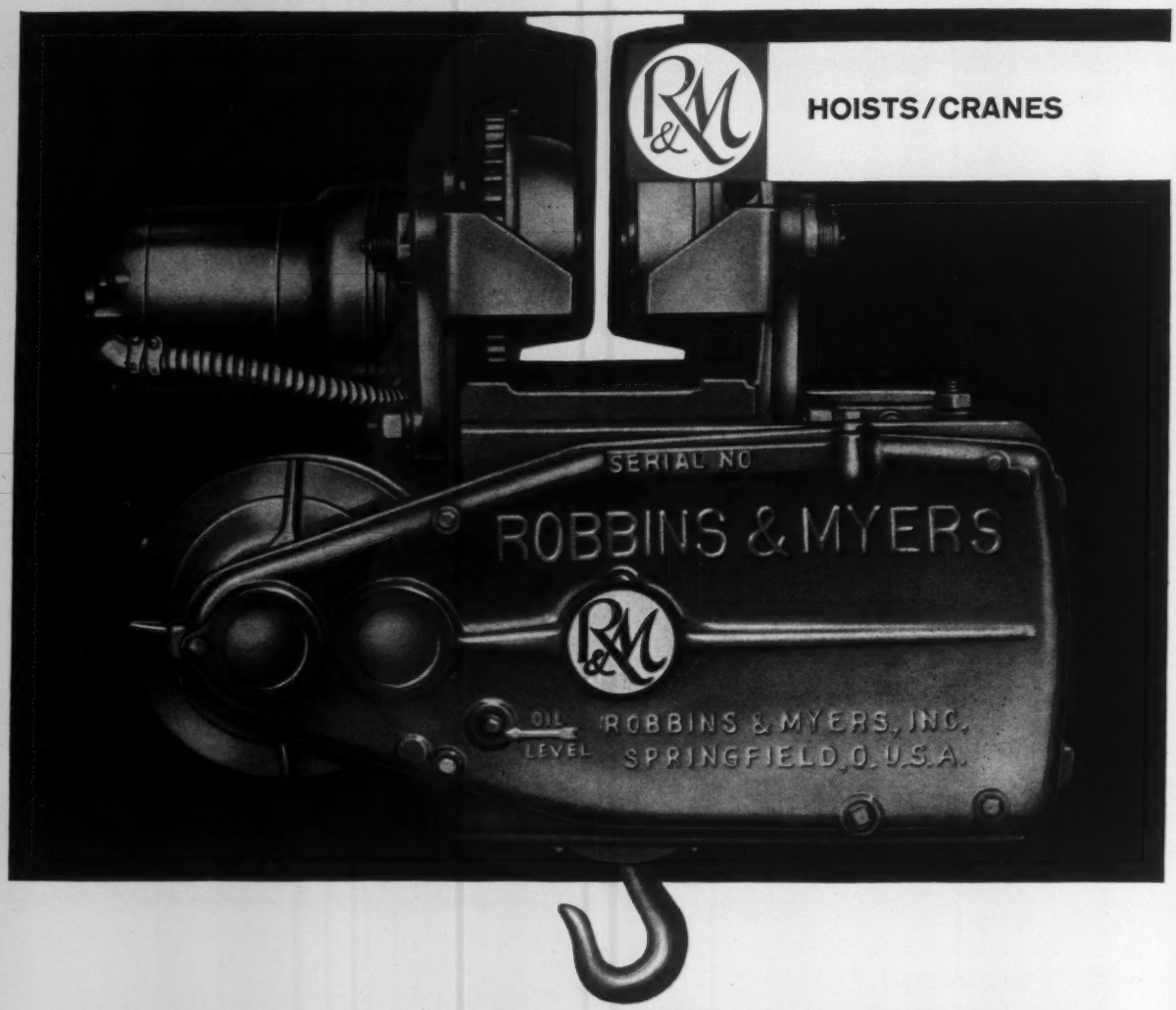
Housing Starts Rise In June

Housing starts in June were up 3.3 pct over May. Private non-farm starts in June totaled 128,700 units. Starts for the month were also ahead of June, 1960,



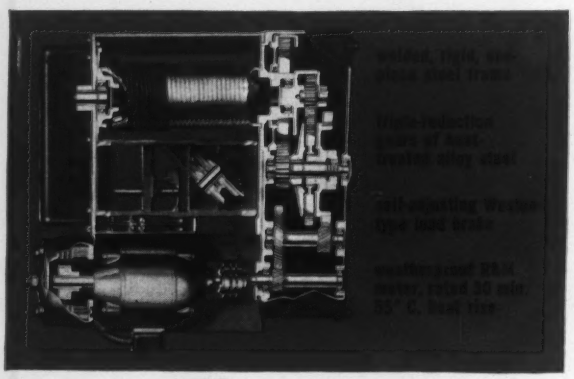
by 6 pct. Private starts in June were at a seasonally adjusted annual rate of 1,347,000 units.

The figures look good. But builders in the North Central states (starts down 6 pct), and in the South (no change), may wonder about them. The housing pickup is accounted for by a 23 pct jump in the West and a 9 pct rise in the Northeast.



BEAM-HUGGING R&M HOIST SAVES SPACE

R&M Type F Hoists hug the beams to save valuable overhead plant space! The drum is along one side of the beam; the motor-and-brake assembly parallel along the other side. This compact design—*yours at no extra cost*—gives inches more usable lift, without building higher runways. It permits closer end approaches, provides greater side clearances. Many safety features protect operator, hoist and load—weight-type upper limit switch, low-voltage control circuit, fully magnetic control, Weston-type automatic load brake, and others. Type F Hoists are available in four frame sizes, ½ to 10 ton capacity, powered by 1½ to 15 HP R&M motors. Mountings include lug suspension, push-type, hand-geared, and choice of three motor-driven trolleys. Write today for Bulletin 920-IA



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Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

UAW: Profit-Sharing Offer From AMC

First positive move has been made in the month-old auto contract negotiations. American Motors Corp. has offered the United Auto Workers a profit-sharing wage plan and 7¢ hourly annual wage increase over the next three years.

AMC asks in return that the cost-of-living and annual improvement factor clauses be dropped from the contract.

The plan: AMC would set aside the first 10 pct of profits before taxes for stockholders. The next 10 pct would go into a "progressive sharing fund" for hourly rated workers.

AMC says "decisions would be made annually by the company and the union jointly as to the distribution of the fund, either in the form of cash payment or through supplemental unemployment benefits and insurance."

The company says it also agrees to "continuation of present employee benefit programs" and said it would make the present 17¢ hourly cost-of-living payment a part of the base wage.

Business Warned About Wage-Hour Violations

The U. S. Labor Dept. is starting a huge campaign to end businessmen's violations of the Federal wage-hour laws.

Two main avenues of the campaign are:

1. Names of employers violating wage-hour rules will be made public for the first time.

2. Employers will be educated as to their new responsibilities under the laws.

Starting next month, employers who are caught paying substandard wages will find their "sins" publicized in government press releases. Up to now, the names have been kept secret.

Missile Base Costs To Get Close Check

The government assault on excessive labor costs at U. S. missile bases is becoming a firm crackdown.

Labor Secretary Arthur Goldberg's missile sites labor commission is going to check contracts covering base construction work. It's an effort to end wasteful practices and overtime pay abuses.

The commission is also setting down guidelines for employers, unions and government agencies involved in the contracts.

How Good a Guide Is An Area Wage Index?

Don't be misled by the over-all wage index in deciding where to build a plant. A study of 32 metropolitan areas by the Pittsburgh Regional Planning Assn. shows individual wage rates don't always fall in line with the broad high-wage or low-wage categories.

Wages within an area can vary sharply by type of industry, union or non-union operation, workers of different sex and color.

For example, Pittsburgh manufacturing and construction earnings are some of the highest. Yet, Pittsburgh retail and service trade wages are among the lowest.

A-L Bolts Bargaining Group

Allegheny Ludlum Steel Corp. has withdrawn from 12-company group organized for labor negotiations with United Steelworkers of America.

Allegheny Ludlum said it withdrew because it was the only producer in the group not fully integrated. Many of its competitors in the specialty field are not affected by labor shutdowns. A number of specialty mills are not organized by USWA, while contract extensions are common among the organized companies.

Originally, the industry bargaining group in 1958 represented 13 companies. However, midway through negotiations Kaiser Steel Corp. pulled out and reached a separate pact. Whether Kaiser will be asked to rejoin the industry group next year isn't known. So far it hasn't received an invitation.

Regarding the possibility of a separate labor pattern for specialty producers, Allegheny Ludlum said: **"We are certainly going to make an effort to impress on the union the need to recognize the differences in specialty steel production."** More manhours go into specialty steels than carbon products, said an A-L spokesman.

Allegheny Ludlum said the withdrawal was made on a friendly basis. Other large mills had no official comment on the move. Privately, some regret is expressed at the whittling down of the bargaining front.

The Steelworkers offered no thoughts on the move. As a general policy, the union has pushed for wide uniformity in contract terms and contract dates. A tool steel producer says there is no new trend toward special consideration for smaller companies.

CINCINNATI

FILMATIC PLAIN GRINDER

Saves up to 35 hours

in grinding hard-surfaced mixing screw

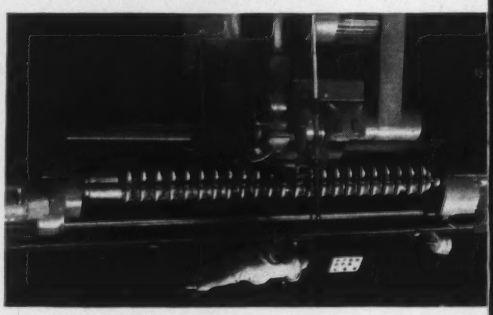
Photographs courtesy of Baker Perkins, Inc., Saginaw, Mich.

Here you see a rough, tough part. It's rough because it has been hard-surfaced by welding. It's tough because, until recently, it taxed the ingenuity of manufacturing engineers to machine it.

The part is a 16″ diameter mixing screw, manufactured by a prominent builder of food and chemical machinery. The problem was to machine the OD of the flights to a smooth finish and at a reasonable cost. Formerly the part was turned on a lathe, requiring 35 to 45 hours. Too expensive. Now, the OD is *ground* in 10 to 15 hours. A CINCINNATI FILMATIC 24″ x 120″ Plain Grinding Machine performs the operation, reducing machining cost by more than half. And, finish is of a much higher quality than ever before.

All CINCINNATI Centertype Grinding Machines are built to remove metal rapidly and to the highest standards of quality. For more information on the heavy duty sizes, Plain and Roll, write for Catalog G-709-1. **Grinding Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**

Huge savings in time are gained by replacing turning with grinding to remove hard, heavy stock on the OD of mixing screws. A CINCINNATI 24″ x 120″ Plain Grinder performs the operation, grinding the rough, interrupted surfaces to a high-quality finish.



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PRECISION GRINDING MACHINES: CENTERTYPE • CENTERLESS • MICRO-CENTRIC • ROLL • CHUCKING • PRODUCTION LINES

By R. W. Crosby

★ How Buildup Affects Industry

Accelerated defense buying rising out of President Kennedy's military speedup will be a production boon to metalworking and related industries in the next 12 months.

More than half the $3.5 billion extra defense funds to step up U. S. preparation for a stiff stand against Russia is for procurement. The exact sum is $1.753 billion.

Aircraft, motor vehicle, and weapons industries will benefit directly, with metal suppliers to these industries getting huge indirect benefits.

Procurement with the new funds will break down like this:

The Army will get $552 million worth of weapons, equipment and ammunition with about a third of the total earmarked for trucks, trailers and other support vehicles. Helicopters, planes, missiles and nonnuclear warheads are also on the list.

About $300 million of the total $709 million worth of procurement for the U. S. Navy will go toward fighter planes and tactical missiles. The rest will go for new ammunition, communications equipment and vehicles, in which the Marine Corps will share.

Much of the $425 million procurement for the Air Force involves planes and spare aircraft parts. Included are all-weather F-105D supersonic fighter bombers and C-130 transports. Missiles, such as the Sidewinder and Bullpup, are scheduled for buying.

Industry will benefit in another way. In order to meet the swift military buildup President Kennedy seeks, the Pentagon will have to speed up its contract negotiation procedures. Slowness of these procedures has long been a thorn in industry's side.

Contracts for most of the $1.8 billion in new procurement are scheduled to be let in the next 12 months.

■ Defense Budgeting Heads Toward Unity

The Pentagon is designing a defense budget blueprint with five-year cost projections of military programs.

The new system will replace dollar guidelines now used in seeking defense funds from Congress. Programs will be grouped by function, rather than military service. Thus aircraft, for instance, would be budgeted for the Defense Dept. as a whole, not as Navy aircraft, Army aircraft and Air Force aircraft.

The Pentagon, then, will have at all times a tentative approved program, fully costed, and projected at least five years in the future.

The budgetary reorganization is seen by some as an indirect step in reorganizing the entire U. S. military into one unified service.

■ Switch May Save Lead-Zinc Subsidies

Efforts to stabilize the lead-zinc industry still are embroiled in dissension. Mining state congressmen are pitted against the Administration.

The Administration has finally agreed that subsidies are needed in the industry. But the subsidies it has in mind are far short of what western congressmen want.

Congressmen want to subsidize lead and zinc producers on their first 2000 tons of each metal annually. The Administration wants a three-year support bill, limited to 750 tons the first year and diminishing to 500 tons the second year and 250 tons the third.

This appears to be the switch in position that eventually will lead to a compromise on Federal subsidies for the ailing lead and zinc producers.

■ New Urban Dept. Involves Industry

Legislation to create a new cabinet department of Urban Affairs and Housing, now moving through Congress, would have important effects on industry.

The department would coordinate Federal aid to urban areas, much as the Agriculture Dept. works in farm areas. Involved are billions of dollars.

The scope of such an agency, and here is where industry is involved, would include these fields of Federal aid: Housing, urban renewal, urban highways, airports, water and water pollution, defense industries, air pollution, industrial development, and civil defense.

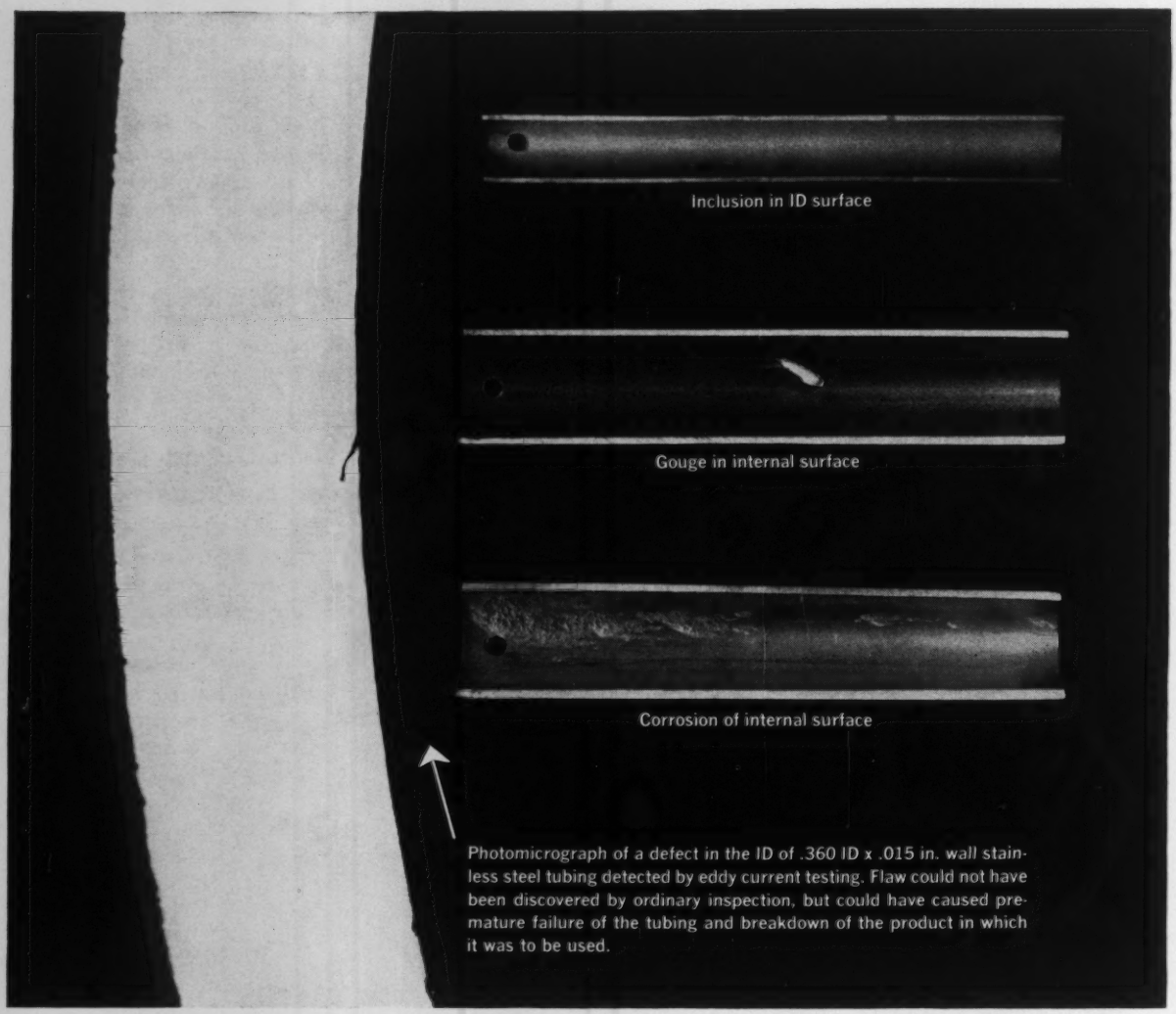
■ Depreciation Noted In Treasury Tax Data

Government is growing more aware of industrial depreciation. Data on depreciation, for the first time, is included in the U. S. Treasury Dept.'s report, "U. S. Business Tax Returns."

Depreciation on corporation returns totaled $18.7 billion in 1958-59. Manufacturing industries reported the largest amount, $8.5 billion.

Depreciation reported on tax returns in the primary and fabricated metal products industries amounted to more than $1 billion of the manufacturing total.

Tomorrow's tubing technology — today



Photomicrograph of a defect in the ID of .360 ID x .015 in. wall stainless steel tubing detected by eddy current testing. Flaw could not have been discovered by ordinary inspection, but could have caused premature failure of the tubing and breakdown of the product in which it was to be used.

Tubing Quality Verified by Nondestructive Tests

Superior tubing for critical applications must be consistently of highest quality and reliability. As a consequence, nondestructive testing is essential. Furthermore, several types of test should be performed, since no one test is versatile enough to supply all the required information.

Eddy current spots defects we don't want in Superior tubing, but it doesn't tell us everything about them. Neither does any one of the other seven nondestructive tests we use in checking the finished quality of our tubing.

Depending on how critical the end use of the tubing is and thus the amount of test information required, we can perform any of the following tests singly or in combination: eddy current, dye penetrant and fluorescent dye penetrant, ultrasonic, radiographic, hydrostatic, boroscopic and magnetic particle. Only in this way can we detect imperfections such as change in analysis and dimension, pits, roughness, inclusions, weld defects, carburization, porosity, corrosion, laps, embedded particles, and surface oxides on OD and ID and in the wall of the tubing.

An article, "Nondestructive Testing of Small Tubing," details and compares the methods used. If you would like a copy, and technical data on the more than 120 analyses of small-diameter tubing produced in our mill, write us. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

Superior Tube (ST)

The big name in small tubing

NORRISTOWN, PA.

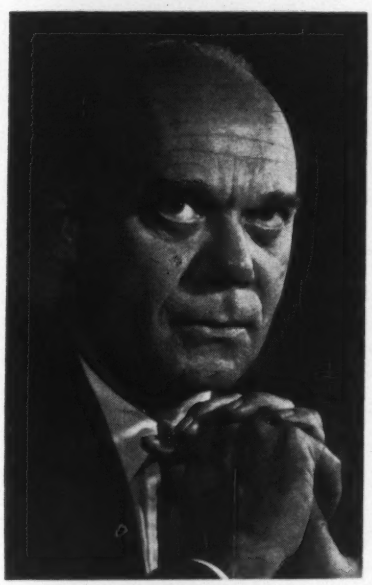
West Coast: Pacific Tube Company, Los Angeles, California

Canadians May Get Monetary Harmony

Canada's monetary policy, loaded with controversy in recent months, may finally be on the road to peace.

And top Canadian officials hope the road ends at the office of Louis Rasminsky. After six years as deputy governor of the Bank of Canada, Mr. Rasminsky was named to replace James E. Coyne as the bank's governor.

Mr. Coyne resigned a few weeks ago following a row with Prime Minister John Diefenbaker. The Prime Minister felt Mr. Coyne's high-interest, tight money policies blocked the government program to combat unemployment and the Canadian recession. On top of all this, there was a personality clash between Mr. Coyne and Finance Minister Donald Fleming.



RASMINSKY: No "yes" man.

Mr. Rasminsky, often outspoken in the past, is definitely not considered to be a "yes" man. But the government feels he will carry out its programs—even if disagreeing.

One of Mr. Rasminsky's biggest assets is his knowledge of international financial affairs. He is an executive director of the International Monetary Fund and the World Bank.

Now that the bank governor issue is settled, Ottawa is clearing the decks for an early Federal election. Betting is the Coyne affair will be the top campaign hassle again when Mr. Diefenbaker puts his case before the people, probably this fall.

Bolivia Seeks Aid For Tin Industry

Bolivia, hovering on the brink of bankruptcy, is seeking more aid from the U. S. for its important tin industry. State Dept. officials say Bolivia has asked for several million dollars to aid a revitalization of the country's tin mining.

The U.S., along with other countries, has already pledged to rehabilitate the nationalized tin industry with a $38 million credit package to be used over the next three years.

This aid is in addition to the $150 million of U. S. funds going to Bolivia for aid every year.

Just a few weeks ago, the Inter-American Development Bank approved a loan equivalent to $4.5 million to help finance work in Bolivia's tin mines. This loan was made directly to the Bolivian Mining Corp.

Big Furnace

The largest electric arc melting furnace in Britain was commissioned recently at the Sheffield works of the English Steel Corp., Ltd. It will be used for the production of special alloy steels.

The furnace, with a shell diameter of 21 ft and an electric rating of 20 MVA, is capable of melting a 90-ton charge in less than three hours.

Export Promotion Plan Awaits Senate Action

Legislation to authorize a variety of services to assist U. S. manufacturers in developing export markets is awaiting Senate action.

Hearings have been completed on S. 1729, a bill introduced by Sen. Clair Engle (D., Calif.), and backed by Sen. Warren Magnuson (D., Wash.). The bill seeks Congressional support for more export assistance for businessmen.

S. 1729 would establish a professional career service within the Commerce Dept. to promote U. S. exports. It would also provide specifically for an expansion of services to small business and establish a broader program for the insurance of export credits against political and commercial risks.

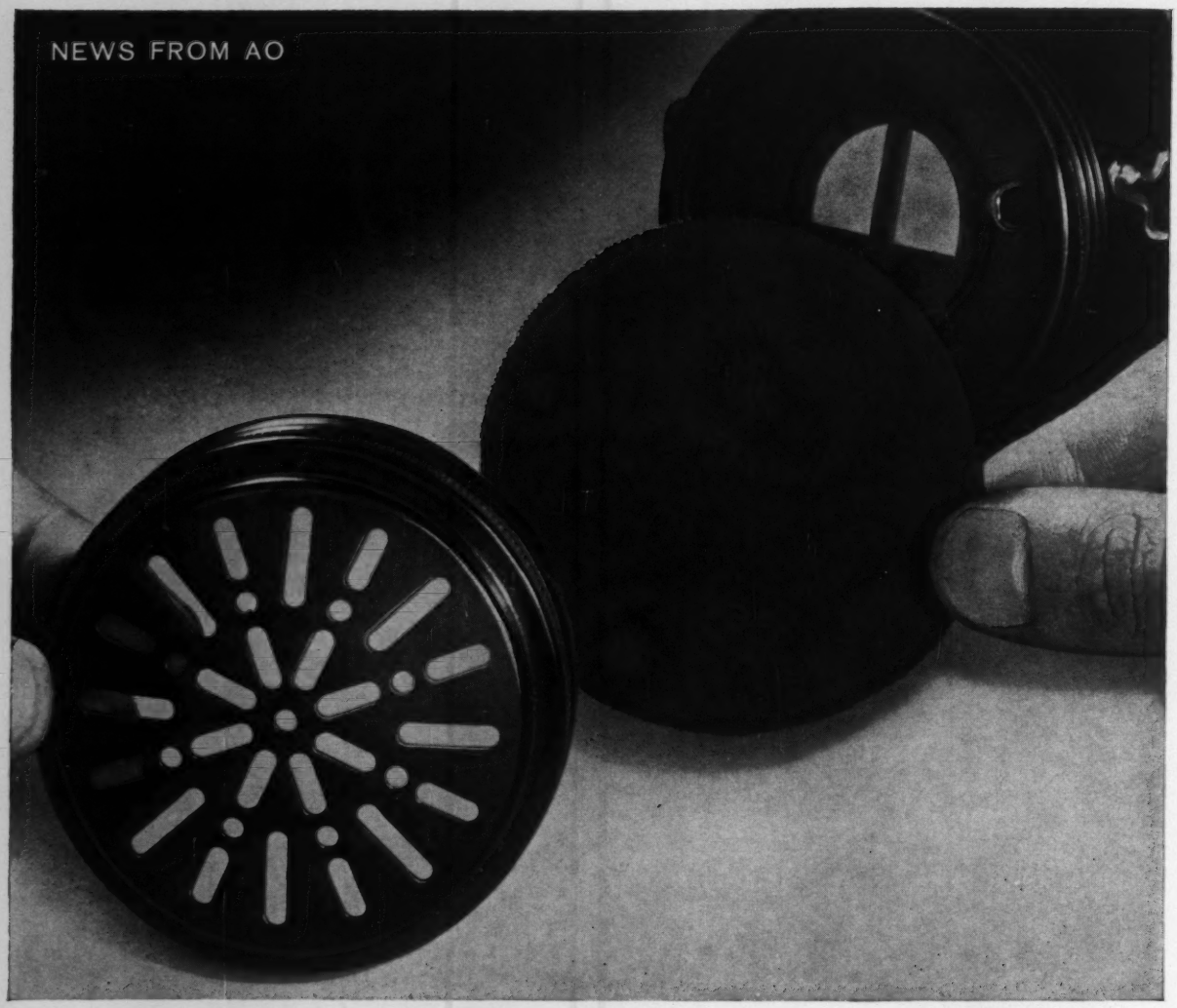
Russia Still Set On Surpassing U. S.

Russia still has plans of overtaking the U. S. in per capita output during the present decade. P. Ivanov, deputy chairman of Russia's State Planning Committee said recently: "By 1965 the Soviet Union will outstrip the U. S. in the total volume of production. By 1970 it will be ahead in per capita production as well."

Russia's current seven-year plan is well ahead of schedule. Total industrial output increased 22.1 pct in 1959 and 1960. The plan called for a gain of 17 pct. The original target was set for an 80 pct gain in output over seven years. But this has now been adjusted to 100 pct.

Mr. Ivanov also noted: "While continuing to develop heavy industry at a fast pace, we can now invest more money in light industry."

Planning organizations in Russia are now busy working on the details for the development of the economy.



R-90 "Red Devil" filter can be inserted in seconds into R-2000 Respirator.

AO "Red Devil" variable density filter gives

Lower Breathing Resistance, Longer Life

Here's everything you want in a respirator filter—high efficiency, low breathing resistance and longer service life. You get it in the compact, lightweight R-90 "Red Devil" filter because of its variable density construction.

A red prefilter is thermally bonded to the gray final filter. Ultrafine asbestos fibers are dispersed through this final filter with a concentration gradient. Larger particles lodge on the prefilter during inhalation, while others enter the final filter until they cannot pass between the asbestos fibers. There is less breathing resistance than if dust piled up on the surface because the top three quarters of the filter works to trap and hold particles without plugging quickly.

AO "Red Devil" filters are approved by the U.S. Bureau of Mines for dusts not significantly more toxic than lead, pneumoconiosis-producing mists and chromic acid mist. They are one of nine interchangeable filters that make the AO R-2000 Series Respirator ideally suited to plants with several respiratory hazards. For details, consult your AO Safety Products Representative.

You get 9 respirators in 1 with the AO R-2000 and its interchangeable filters

Cartridge or filter	Hazard
R-90	All dusts and mists
R-15	Nuisance and pneumoconiosis-producing dusts
R-16	Toxic dusts not significantly more toxic than lead
R-17	All dusts not significantly more toxic than lead
R-31	Organic vapors
R-32	Acid gases
R-33	Organic vapors and acid gases
R-34	Ammonia
R-35	Dusts and organic vapors simultaneously

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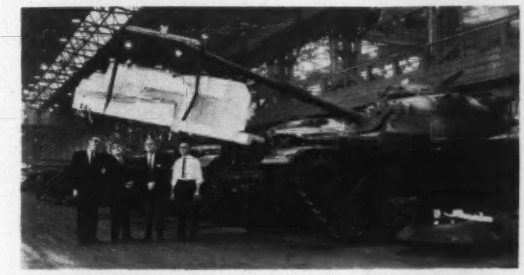
SAFETY PRODUCTS DIVISION • SOUTHBRIDGE, MASSACHUSETTS

Tanks Take on Aluminum

Today's armored tanks can really get around. The latest vehicle, the M-60, now sports a 105-mm gun, a bigger power pack and better armor protection. These factors add up to more weight. The increase however, is offset by using aluminum wherever possible. Aluminum fuel tanks and wheels are a big step forward. The turret platform, ammunition racks and other appurtenances are also made of aluminum to cut weight. Even the top of the engine compartment is aluminum armor. The result: Increased cruising range.



LIGHTER FUEL CELL: Means more go-power.

Workers Get the Word

Certain assembly lines would be called upon to make a quick changeover if a national emergency is to be declared. Worker training would be the first problem. One company has audio-visual training devices ready to go. The units combine colored slides synchronized with a taped sound track. The worker looks at a screen, listens for instructions through earphones, and then follows the assembly steps. The system's controlled by the worker to prevent any speedup.

Calcium Cleans Steel

High-grade steel can be further strengthened by decreasing its sulphur content through inoculations of calcium. So reports the Army Ordnance Corp. Broken tensile bars of 4325 and 4340 desulphurized steels showed improved ductility and toughness over normal grades of the same strength levels. A 0.36-pct calcium inoculation, together with a basic slag cover, can drop the sulphur content from 0.25 pct to 0.002 pct in about 10 minutes.

Spec Pinpoints Hardness

Carbon steel will fit definite hardness standards established under an SAE specification soon to be published. The new spec calls for 1041 and 1045 to fall within fixed hardness bands. Standard end-quench tests will supply the yardstick. Hardness depth and range of hardness for a given depth, will also be spelled out. In the past, only alloy steels were specified in this manner. Carbon steel had been ordered by chemistry.

Program Tube Bending

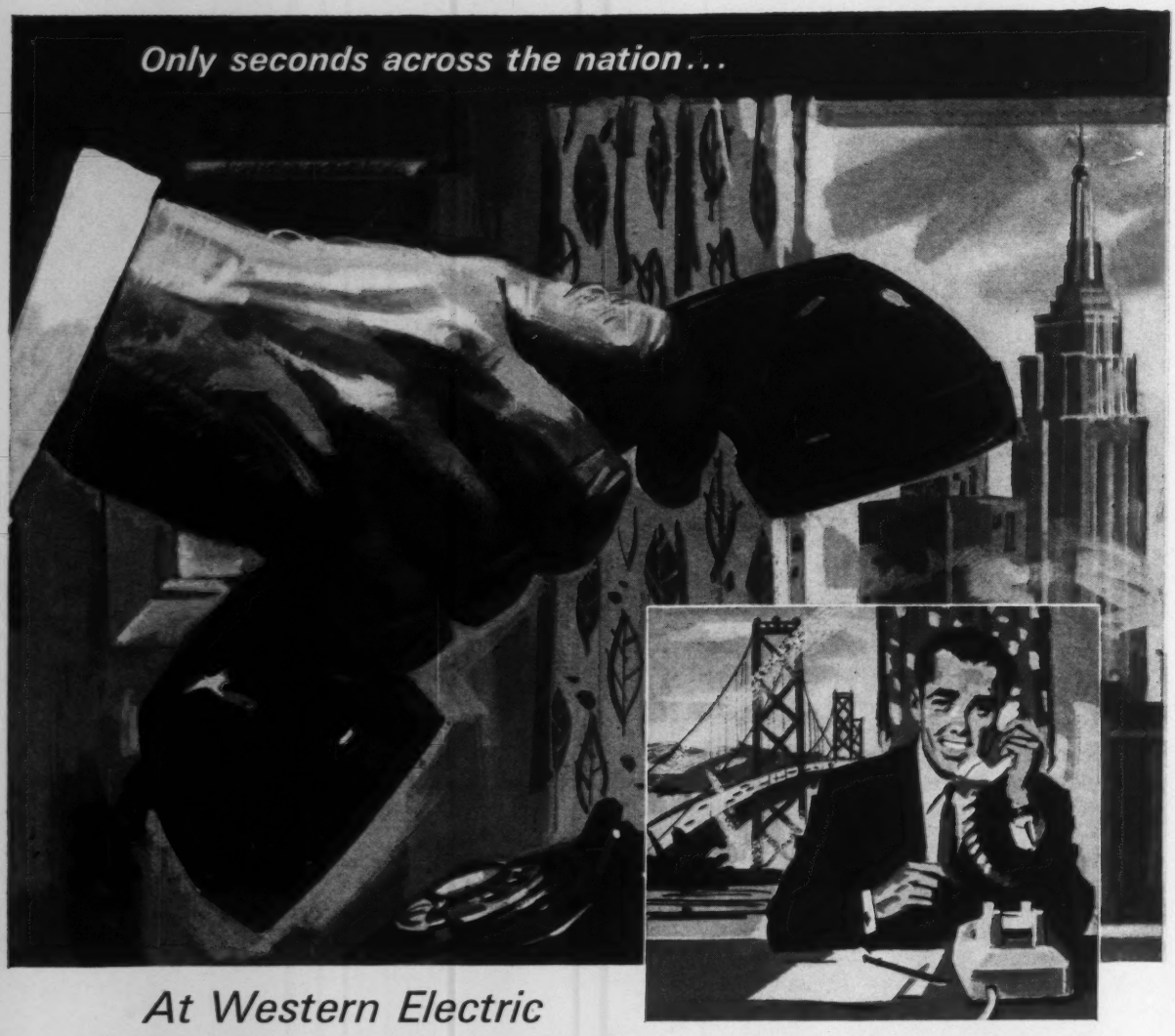
With numerical programming, difficulties of tube installation may well be solved. Springback lengths and precise shapes can now be assured by using a computer. A tape-controlled bender, with existing tooling, can be set up in minutes. First applications are expected in missiles and high-speed aircraft. Here, many failures are caused by overstressing, bad bends and other tubing-installation faults.

New Life for Metal Dies

Each 0.001 in. of die metal produces a certain number of stampings. If you grind away even the smallest amount unnecessarily, there's that much less life in the tool. However, with a new precision microscope, you can determine exactly the amount of metal which must be ground off to resharpen the tool properly. It measures die wear over a range of 0.020 in. Accuracy is ± 0.0005 in., or 10 pct of depth, whichever is greater.

Farmer To Try Turbine

Under the fiberglass skin of its newest research tractor, International Harvester Co. has paired a gas-turbine engine with a hydrostatic transmission. This striking concept of things to come in the tractor line has no gear lever, no throttle, no brakes or clutch pedal. It uses neither water nor anti-freeze and oil consumption is almost nil. The single-shaft gas turbine engine produces 80 hp to obtain speeds up to 11 mph.



At Western Electric

MEAKER AUTOMATIC DELIVERS CONSISTENT QUALITY ZINC PLATING FOR MILLIONS OF SWITCH PARTS

How large the world? No more than the minutes it takes to telephone *anywhere!* A pioneer in communications is the Western Electric Company which builds years of rugged service into every piece of telephone equipment produced at its extensive Hawthorn Works, Chicago. Superior performance is a never-ending quest of Western Electric production engineers.

The Meaker "Automatic" was chosen and installed four years ago to zinc plate switch mounting plates and relay covers. These are parts of busy telephone central offices—the communication nerve centers of offices and factories throughout the United States.

Since 1899, Meaker engineers have been building automatic metal processing equipment. These range from units tailor-made to fit limited floor space and handle modest output to the largest plating installation in the world!

Whether large or small, every Meaker is made to save its owner money—through lower labor costs, greater plating uniformity and greatly improved product quality. Send for our new catalog "When to Automate" which will give you some valuable ideas on improving your profits—and products—through automatic plating or metal finishing.

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76-lb Flask?

Sir — Mr. Harry Sharpe's explanation of the origin of the 76-lb weight for a flask of mercury (Letters from Readers, IA—July 13) does not seem fully correct.

He stated that a quintal is 76 lb avoirdupois. A short quintal is 100 lb avoir. A long quintal is 112 lb avoir. And a metric quintal is 220.462+ lb avoir.

In South American countries, a quintal varies from 101.3 lb avoir in Argentina to 129.54 lb avoir in Brazil. The old iron flasks of mercury contained the equivalent of the old Spanish hundredweight, 34.5 kilograms. This 34.5 kilograms is equal to 76.06 lb avoir. The present Spanish quintal is equal to 46 kilograms or 101.41+ lb avoir.

Mr. Sharpe states that "under present Spanish custom etc. . . ." The three weight changes cited were instituted by the United States—not Spain. And I don't believe the quintal was ever associated with the apothecary or troy lb.—Frank W. Finnegan, Brooklyn, N. Y.

Avid Reader

Sir—Although I am an avid reader of The IRON AGE, I admit to not reading it from cover to cover. Your editorials, however, are a must on my list. You have the gift of saying what so many of us feel but cannot express.

May your free American spirit find expression in these editorials for many years to come.—Pieter W. Schipper, president, Henszey Co., Inc., Watertown, Wis.

More Readers?

Sir—I so thoroughly enjoy the plain common sense of your editorials that I set aside the issue of July 6 with the intention of expressing my appreciation. Something interferred with the dictation of the respective letter. But your editorial in the July 13 issue ("Foreign Aid: What to Do About It?") will do equally well.

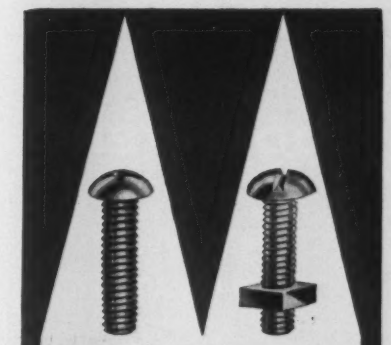
In my opinion, it is too bad that your expressions of straight-forward thinking should be limited to the readership of The IRON AGE, even though this is a very fine medium for your messages. Nevertheless, more people—and especially more businessmen—ought to read your editorials. It might help their thinking.—F. F. Loock, president, Allen-Bradley Co., Milwaukee.

Editorial Praise

Sir—I have just read the editorial in your July 6 issue. This particular editorial, I believe, should be read by every American citizen. Seldom have I had the pleasure of reading an article which so clearly and tersely states the facts as well as the absurdities of our present muddled political and economic situation.

My sincere congratulations to an American whose objectives I thoroughly and heartily support.—Donald E. Babcock, Republic Steel Corp., Cleveland.

"What do you mean I don't know what I'm talking about? You're the one who doesn't know what I'm talking about!"



FOR VARIETY

STANDARDIZE 100% ON SOUTHERN FASTENERS

A stock of 1,500,000,000 USA-made fasteners means that Southern's variety of items, sizes, materials, head styles and finishes can be your source of constant supply. Standardize 100% on Southern fasteners, and forget about carrying a large, costly, space-consuming inventory. Let Southern's variety and famous service help solve your fastener problems.

It will pay you to try Southern on your next order. Write today, using your letterhead, for our Stock List showing current variety of fasteners ready for delivery in large or small quantities. Address: Southern Screw Company, P. O. Box 1360, Statesville, N. C.

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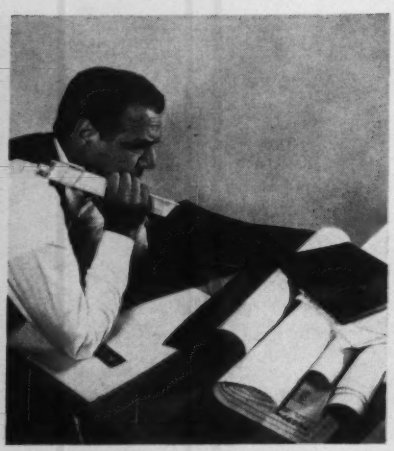
NEW TOOL STEEL SERVICE

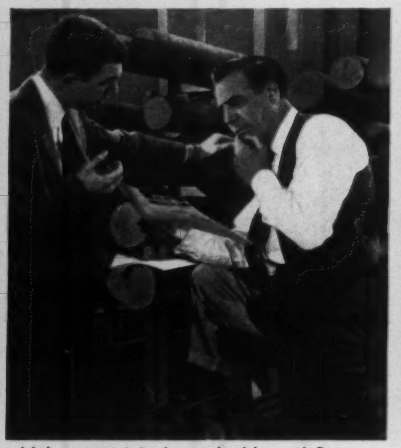
helps you estimate costs more accurately!



Estimating tooling costs, especially on new jobs,

becomes more accurate and profitable with Crucible's new Tool Steel Service.

This service enables you to use fewer grades of tool steels . . .



which you get to know inside-out! So, you can more accurately predict

machining and bench time, and response to heat treating.

And because you're completely familiar with all the basic grades you use . . .

you can pin-point your estimates and your actual costs.

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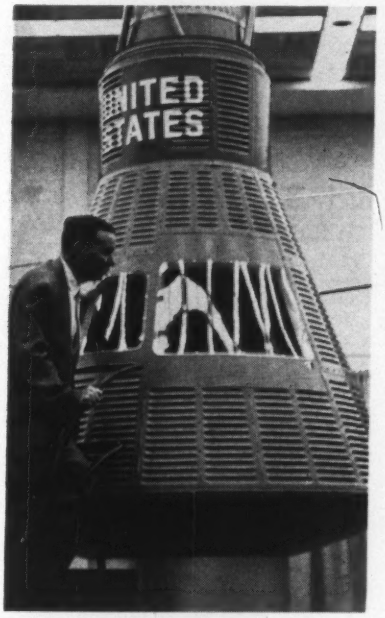
Space Age Editor

The determined man climbing the steps to the duplicate of the Liberty Bell space capsule in the picture below is not an astronaut. He's our machinery editor Ralph Eshelman.

Luckily for us, Ralph isn't interested in becoming the first IRON AGE man to explore space. His checkout of the capsule was just part of his coverage of the recent Michigan Missile and Space Conference.

Down to Earth—All of Ralph's exploring of space is done with his feet firmly planted on the ground. But, together with other Iron Age editors, he keeps our readers up-to-date on metalworking's present and future part in the space age.

That assignment keeps Ralph on the go. Last week's issue illustrates the factual, informative stories he turns out. His coverage of the Michigan Space Conference brought the story on "Aerospace Buying Tightens Up." (IA, July 27, p. 80.)



READY FOR BLAST-OFF? Actually Machinery Editor Ralph Eshelman was just giving this duplicate of the Liberty Bell space capsule his editorial checkout during recent Michigan Space Conference.

Second in a Series—For the same issue Ralph prepared the second in our series of articles on Metalworking's Technological Explosion. This eight-page article on future power systems was strikingly illustrated with four-color photos. Its preparation took many weeks, included interviews with the leading experts about energy sources.

Another Eshelman contribution in the July 27 issue was his regular weekly column on the machine tool industry.

All in all, we'd describe Ralph as a working — and technically astute—metalworking editor.

Price Trends

If we were asked to single out one simple subject of greatest interest to metalworking, we would put "prices" at the top.

There are several reasons. Obviously, everyone in metalworking is cost-conscious, and therefore price conscious. Every metalworking plant has the dual role of a buyer and a seller. And, lately almost everyone is preoccupied with a cost price squeeze.

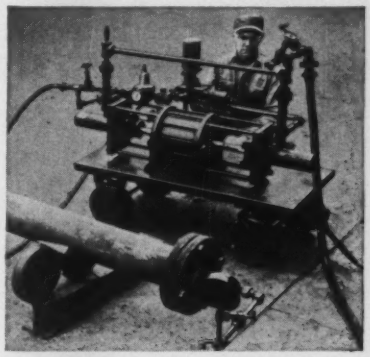
Trend Developing — However, our editors have noted a change in attitude that set us to wondering if a new trend in industrial prices isn't developing. If it is, we wanted to be the first to report it.

In this week's Special Report, p. 39, you'll find an up-to-the-minute report of price developments. Our Pittsburgh editor G. J. McManus was assigned to the job of tracking down price developments and analyzing trends.

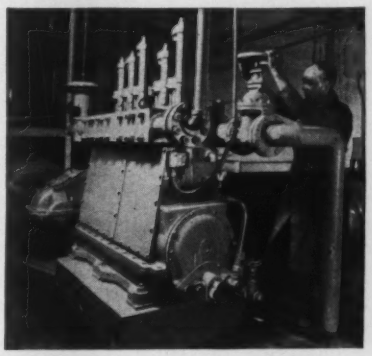
As usual, and as readers have come to expect, George has done another thorough job.

We think this is an important report on industrial prices and is "must" reading for everyone involved in buying and selling.

Need a pump as tough as these?



A familiar sight at one plant is this Aldrich Hydraulic Pump. It's been given plenty of work to do pressure testing process equipment . . . pipe, heat exchangers, tanks, coils, special pressure vessels from 300 to 7330 psi. To get it from one of a dozen tasks to another, quickly, maintenance men have mounted the pump on a portable rig. The company reports that with this Aldrich Pump, equipment testing is faster, more efficient than before.



Two Aldrich reciprocating pumps lead a busy life here, keeping hydraulic presses on-line three shifts a day. For this molding and extrusion operation, pressures must be—and are—maintained at a steady, high level. The penalty for any deviation is up-and-down quality, soaring reject rate. This is rugged duty, but no unscheduled downtime has ever occurred since the pump was installed.

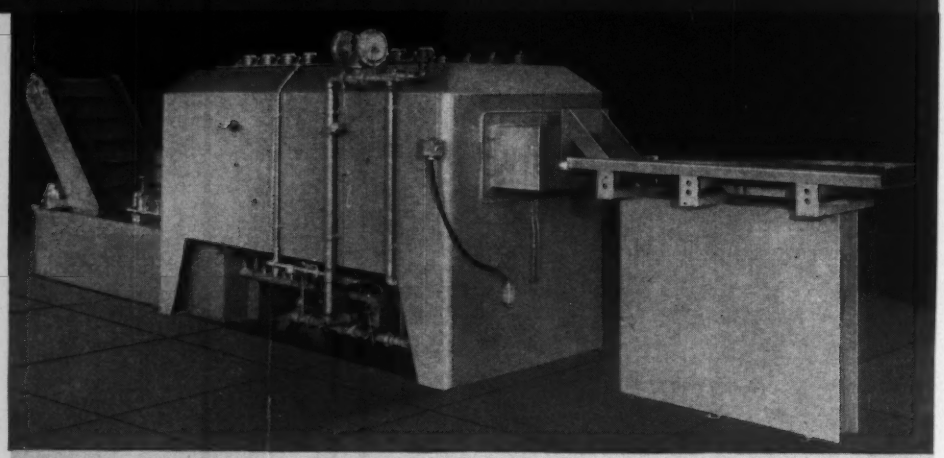
For pumps of 5 to 2500 hp, pressures to 50,000 psi, write Aldrich Pump Co., 8 Pine St., Allentown, Pa. You'll get a pump as tough as these because...

THE TOUGH PUMPING PROBLEMS GO TO

ALDRICH

new Ipsen shaker-hearth furnace with

100% forced convection heating



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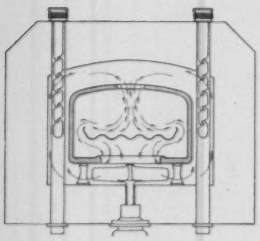
- Parts Individually Quenched For Uniformity and Maximum Hardness.
- New Shaker-Mechanism and Hearth Assures Uniform Case Depth.
- Patented Conveyor Prevents Parts Sticking.



Ipsen 100% forced convection heating is achieved through a high-velocity directional flow of controlled atmosphere around heating tubes. The flow is directed against parts as shown, resulting in fast and uniform heating.

Ask for an Ipsen engineer to call and give you complete information relating to your work.

AUTOMATIC Ipsen HEAT TREATING UNITS

IPSEN INDUSTRIES, INC. DEPT. 723 P.O. BOX 500 ROCKFORD, ILLINOIS

COMING EXHIBITS

Plastics Materials Show—Applications Clinic, August 15-16, Santa Monica Civic Auditorium, Santa Monica, California.

National Chemical Show—Sept. 5-8, International Amphitheatre, Chicago. (Chicago Section, American Chemical Society, 86 E. Randolph St., Chicago 1.)

Industrial Building Exposition—Sept. 25-28, New York Coliseum.

Detroit Metal Show—October 23-27, Cobo Hall, American Society for Metals.

MEETINGS

AUGUST

American Institute of Electrical Engineers — Pacific general meeting, August 23-25, Hotel Utah, Salt Lake City, Utah.

American Society of Mechanical Engineers — West Coast Conference, August 28-30, University of Washington, Seattle, Washington.

Metallurgical Society of AIME—Semiconductors conference, Aug. 30 - Sept. 1, Ambassador Hotel, Los Angeles. Society headquarters, 29 W. 39th St., New York.

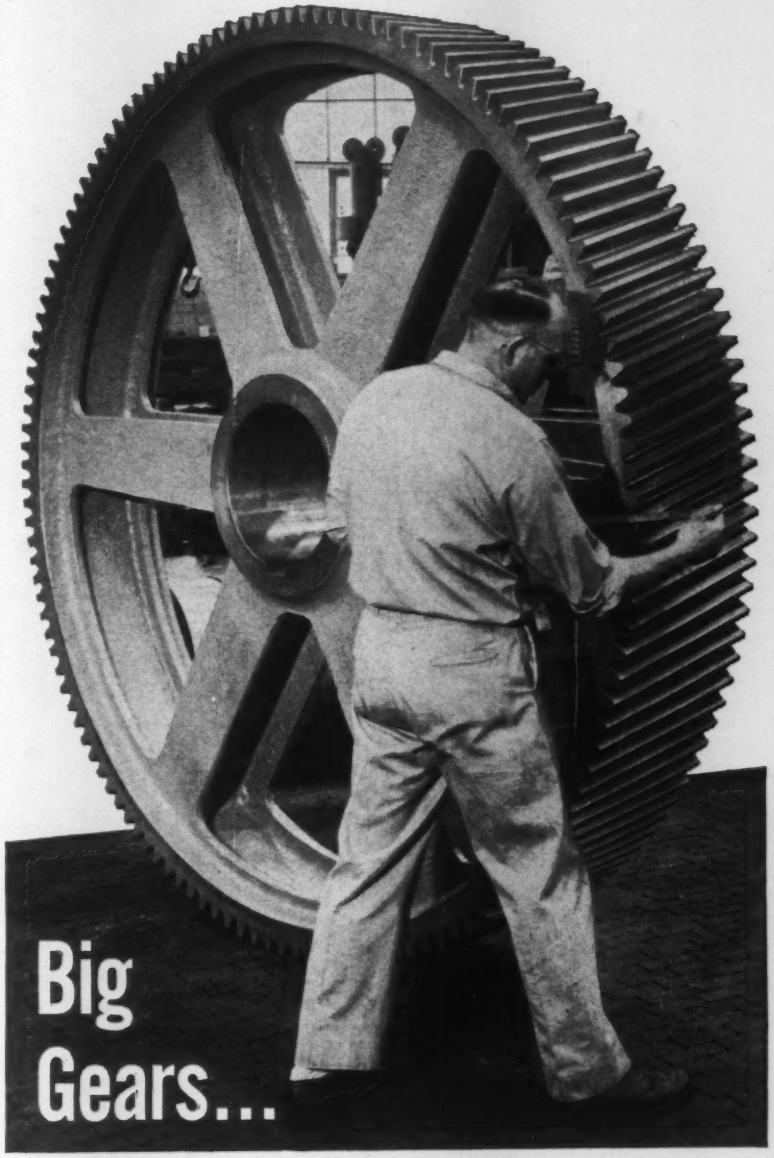
SEPTEMBER

Air Moving and Conditioning Assn., Inc.—Annual meeting, Sept. 10-14, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, Guardian Bldg., Detroit.

International Industrial Conference—Sept. 11-15, Masonic Memorial Auditorium, San Francisco.

Society of Plastic Engineers, Inc.—Regional Technical Conference, Sept. 12, Central Indiana Section, Severin Hotel, Indianapolis.

(Continued on P. 22)



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Horsburgh & Scott specializes in fast production of quality industrial gearing . . .

Gears engineered to meet custom requirements in a wide range, from small to large sizes.

Speed Reducers produced in standard types and special drives for fast custom delivery.

Send your specifications, or let our technical staff make recommendations.

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The HORSBURGH & SCOTT CO.

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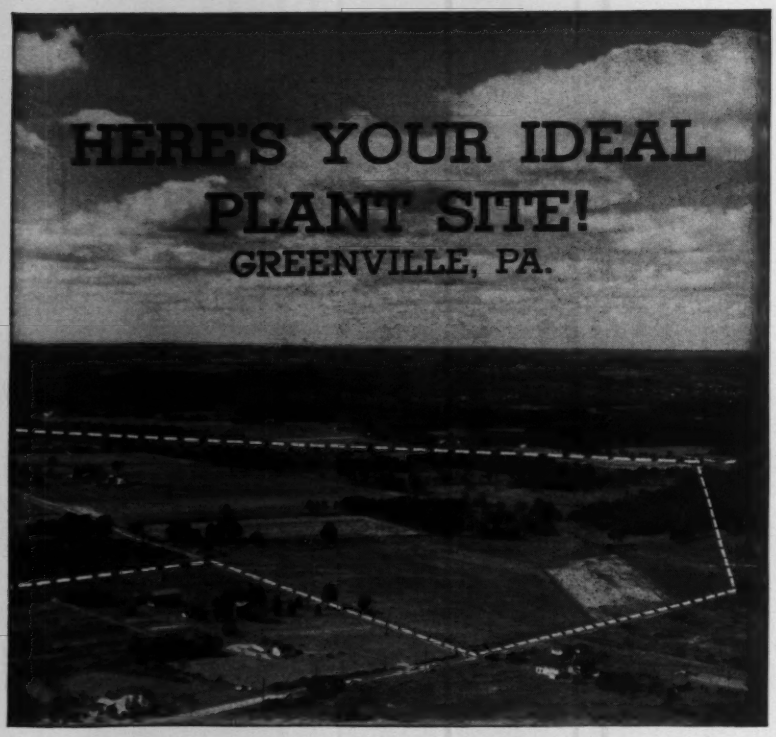
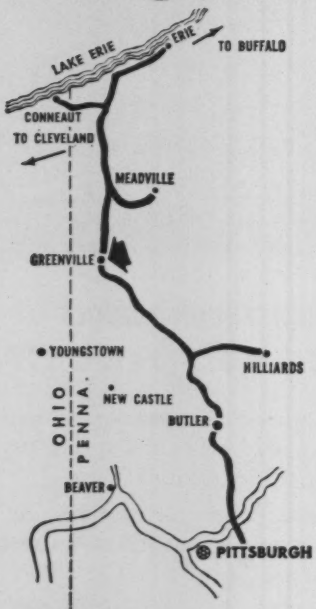
Manufacturers of Gears and Speed Reducers for over 75 years



Attractive, Level, Flood-Free Land Close to Metropolitan Markets of Pittsburgh, Cleveland and Buffalo



This adaptable 750 acre plant site is ideally located adjacent to Greenville, Pa., and is only 80 miles from Pittsburgh and Cleveland; only 150 miles from Buffalo. Next day rail delivery to these points.

Extensive deposits of coal, limestone, clay and aggregates nearby. Steel and other basic materials available with 24-hour delivery service.

Investigate today! Write or phone for *location factors* of this site.

BESSEMER and LAKE ERIE RAILROAD CO.

INDUSTRIAL DEVELOPMENT DEPARTMENT

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The Bessemer Man is at your "Site Service"

MEETINGS

(Continued from P. 21)

Non-Ferrous Founders' Society—Annual meeting, Sept. 17-21, Shawnee Inn, Shawnee-on-the-Delaware, Pa. Society headquarters, University Bldg., 1604 Chicago Ave., Evanston, Ill.

AEC Welding Forum — Annual meeting (classified), Sept. 20-22, Southwest Research Institute. Institute headquarters, Granada Hotel, San Antonio, Texas.

Industrial Electronics Symposium —Sept. 21-22, Bradford Hotel, Boston. Institute headquarters, 51 East 42nd Street, New York 17.

Pressed Metal Institute — Annual meeting, Sept. 24-28, The Grand Hotel, Point Clear, Ala. Institute headquarters, 3673 Lee Rd., Cleveland.

American Welding Society — Fall meeting, Sept. 25-28, Adolphus Hotel, Dallas, Texas. Society headquarters, 33 W. 29th St., New York.

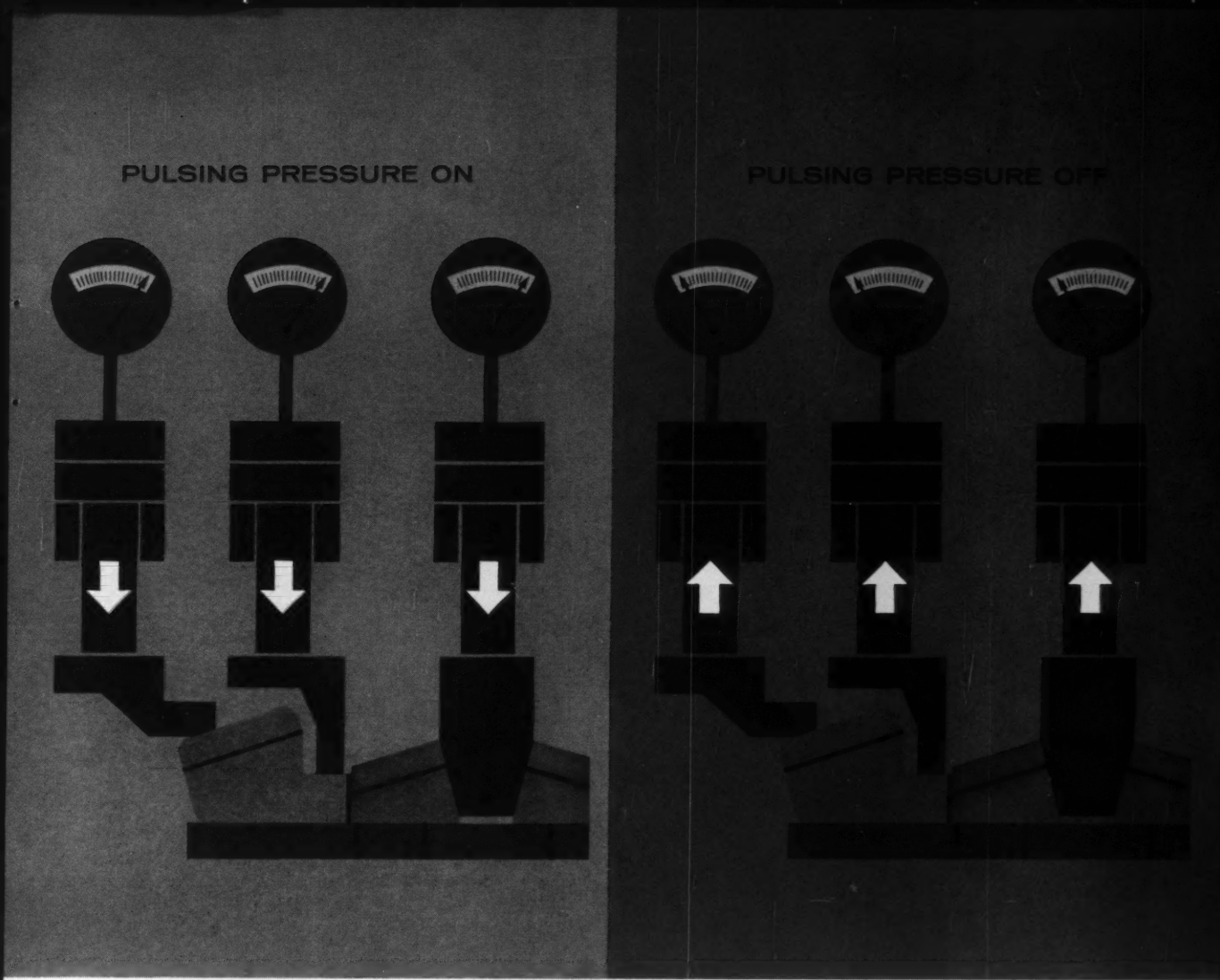
Assn of Iron and Steel Engineers —Annual convention, Sept. 25-28, Penn-Sheraton Hotel, Pittsburgh. Assn. headquarters, 1010 Empire Bldg., Pittsburgh.

Steel Founders' Society of America Annual Meeting, September 25-26, The Homestead, Hot Springs, Virginia.

American Die Casting Institute Inc. and The Die Casting Research Foundation—Annual meeting, Sept. 27-28, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

American Production and Inventory Control Society—Annual national conference and technical exhibit, Sept. 28-29, Pick-Congress Hotel, Chicago. Society headquarters, 330 S. Wells St., Chicago 6.

Purchasing Agents Assn. — 14th Pacific Inter-Mountain Conference, Sept. 29-30, Westward Ho Hotel, Phoenix, Arizona.



New Quenching Machine pulsates to eliminate distortion

The pulsing feature of the No. 529 Quenching Machine allows the use of high pressures to control distortion of parts under quench. Pulsing, which is a way of alternately applying and releasing pressure on the part, allows for the natural contraction of the part . . . and eliminates stresses in the part-die relationship.

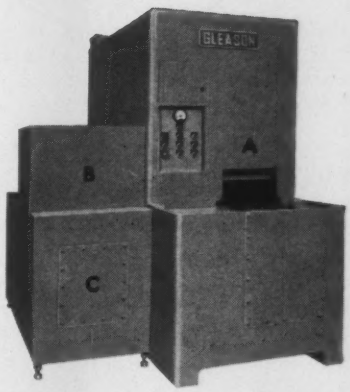
You get tremendous latitude in control of the quench, since as much as 200 gallons of oil can be pumped over the parts.

Simply preset the oil flow with valves and timers, and you have the following automatic cycle: start with a fast quench to set the part, switch to a lower rate; then finish with a rapid quench or vary the sequence any way you wish.

The hydraulic system has a maximum of 1000 pounds of pressure per square inch; a combined total of 50,000 pounds of pressure is available on this machine.

You can handle parts up to 10½ inches in diameter and 4 inches high in the No. 529 Quenching Machine. And it is available in three variations; by adding units as shown in the caption, production is greatly increased.

Drop us a card, and we'll send you more data on specifications and operation.



The basic No. 529 Quencher (A) is manually loaded and unloaded. Automatic unloading (B) is easily added. An auxiliary quench chamber (C) can be added for high production work.

GLEASON WORKS

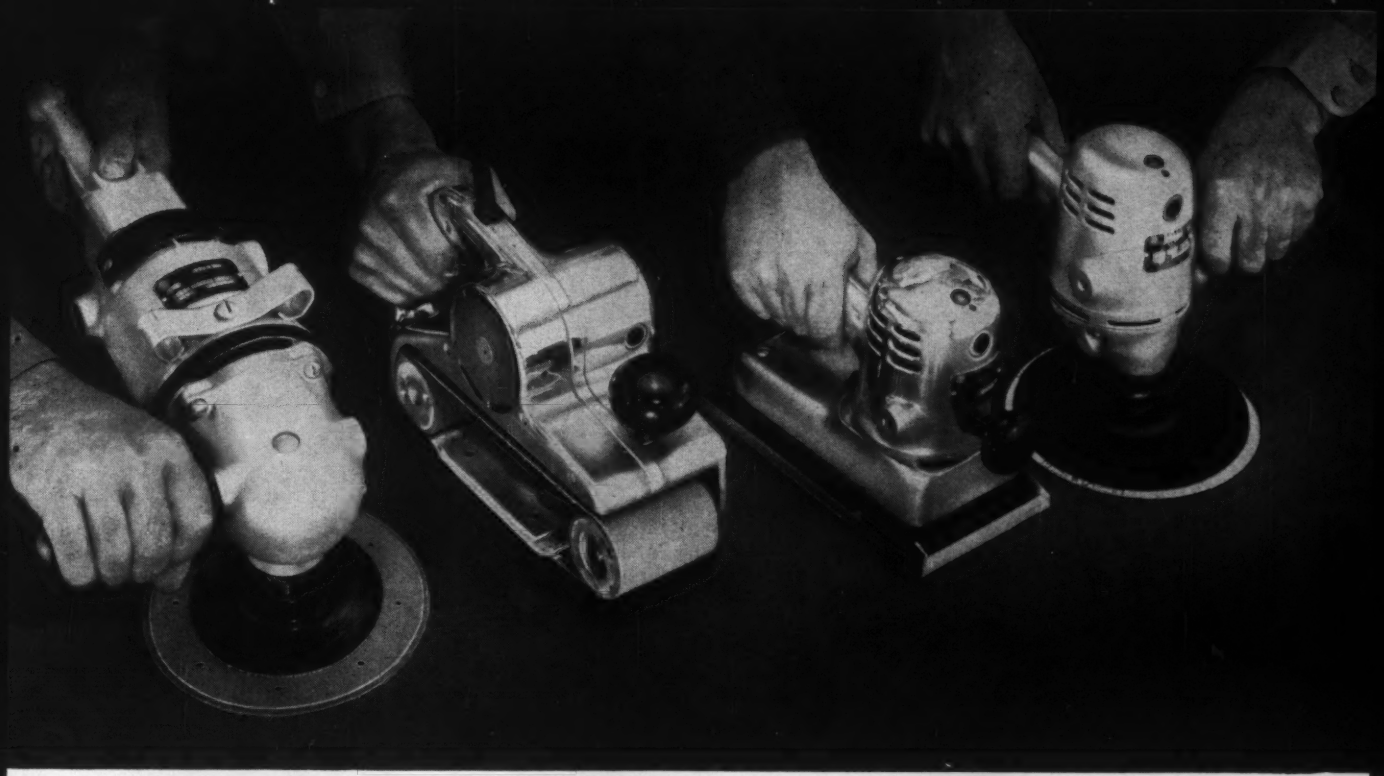
1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

93

A roll's life holds no secrets

Men like National's metallurgist Joe Marsalka see to that. Before your roll is born, National helps select the proper composition, grade and hardness. As it is being produced, our metallurgists carefully control chill locations, pouring procedures and heat treatment. When the roll is "full-grown" ultra-sonic testing equipment checks its internal soundness making sure your roll is ready for the tough life ahead. Even after your roll is shipped, National keeps in touch with its performance in your stand. This intimate knowledge of roll life is one reason we are able to consistently produce quality steel, iron and nodular iron rolls. It's a big reason why... NATIONAL'S THE GROWING NAME IN ROLLS.

NATIONAL ROLL & FOUNDRY DIVISION
GENERAL STEEL INDUSTRIES, INC., Avonmore, Pennsylvania
General Steel Industries, Inc., General Offices: Granite City, Ill. Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.
Subsidiary: St. Louis Car Company, St. Louis, Mo.



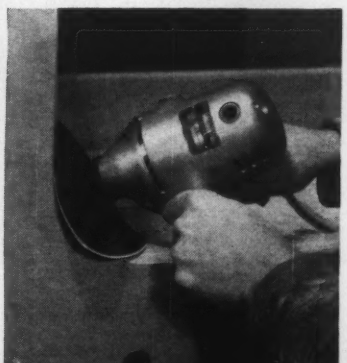
For any surface, rough or fine . . . look to Black & Decker's complete Sander line!

FAST FINISHING NO. 88 H.D. SANDER leaves no swirl marks for a satiny surface. Sand with, against or across the grain.

DUSTLESS BELT SANDER with unique vacuum hook-up. Sand all surfaces free from dust. Choose from six H.D. models.

HUSKY H. D. SANDER - GRINDER ideal for heavy-duty sanding or grinding jobs. 4 models to fit every type of industrial use.

NEW 7" BALL-BEARING SANDER makes sanding, brushing and polishing light and easy. 4 models, ideal for contour sanding.



For heavy-duty material removal or satin smooth surfacing, for a fast finish or dustless performance . . . there's a Black & Decker Sander just made for your job. Belt, disc or orbital design, every Black & Decker Sander is high-powered for standout service to stand up under any work load . . . well-balanced for easy handling, effortless sanding . . . fully protected against abrasive dust and dirt. B&D Disc Sanders double perfectly for grueling grinding jobs, too.

See the complete line. Clip and mail this coupon *now* . . . or call your nearby B&D distributor. *For Sales or Service, look in the Yellow Pages of your telephone book under . . .*

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☐ Please arrange a demonstration of a B&D Sander.

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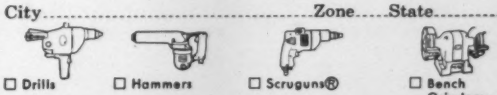
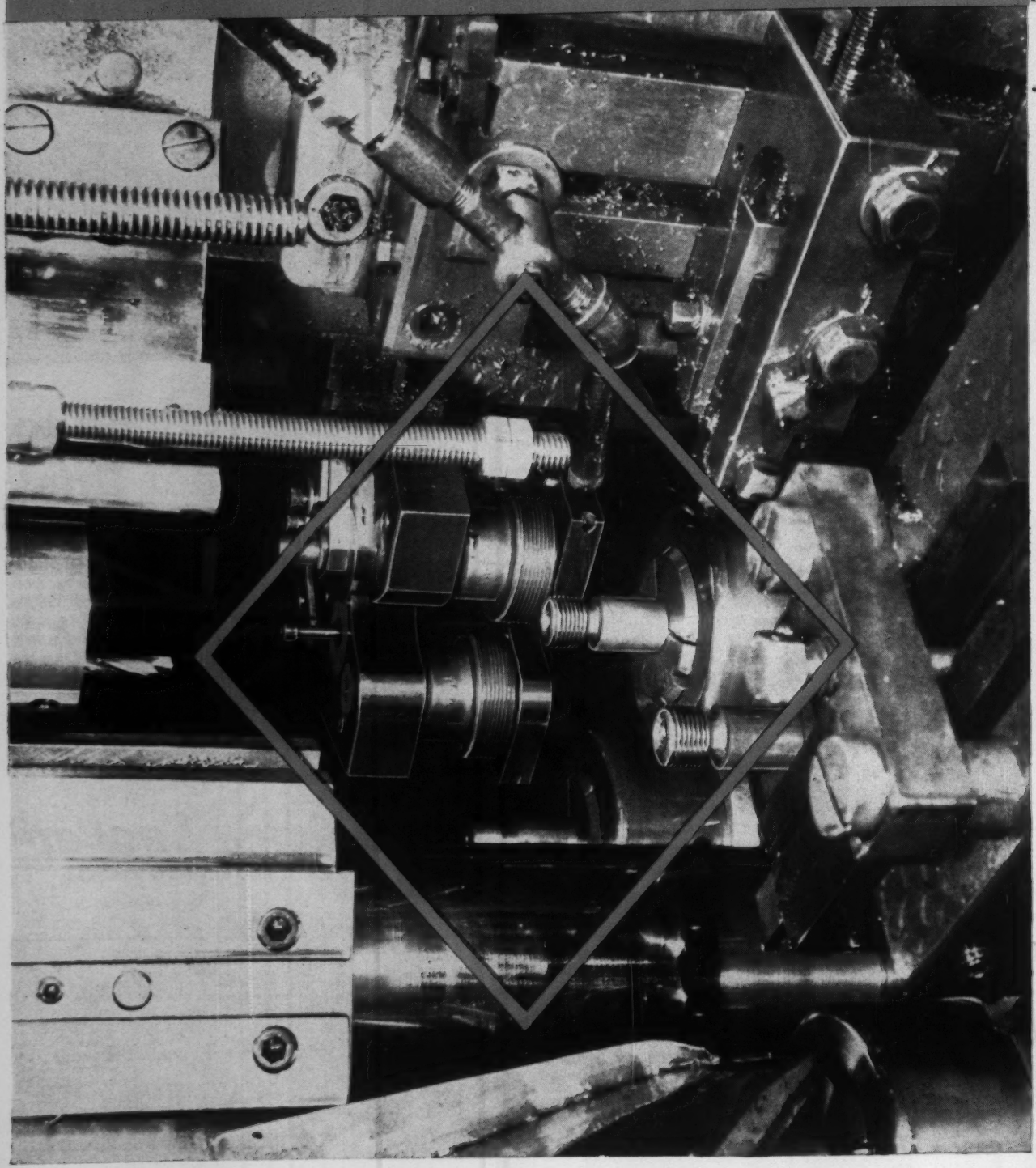
City_____Zone_____State_____



☐ Drills ☐ Hammers ☐ Scrunguns® ☐ Bench Grinders

1/2" taper pipe thread



rolled with the LANROLL attachment

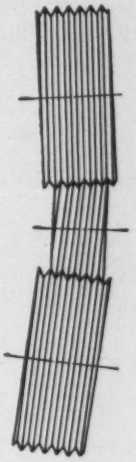
The recently developed LANDIS Method for precision rolling of taper pipe threads is shown at the Mac-It Parts Company, Lancaster, Pennsylvania, in the production of pipe plugs.

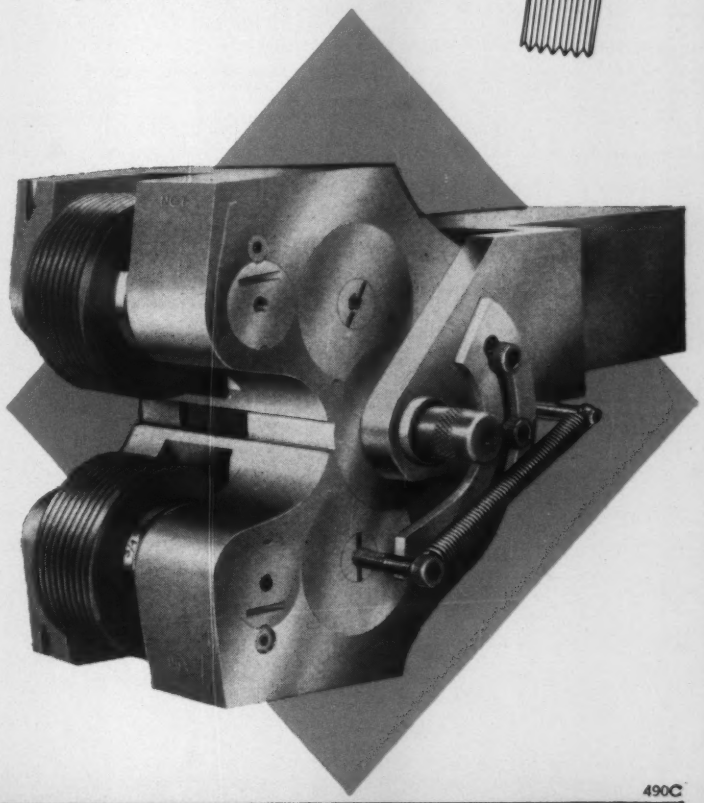
1/2" 14 pitch American Standard Taper Pipe threads are being rolled 9/16" long to dry seal specifications on 4140 steel (207 Brinnell). The #22GA LANROLL Attachment (with a pipe range of 1/8" to 1") is used in the third position on a National Acme Bar Automatic —45,000 pieces are threaded with each set of rolls.

To produce the taper, the rolls of the LANROLL Attachment are supported on carbide shafts inclined to the required thread taper. This design enables the use of parallel rolls (see diagram) which reduces slippage between the workpiece and rolls. With reduced slippage, roll life is materially increased. In addition, attachment stabilization (limited sidewise movement) is greatly improved to permit rolling directly to a shoulder with safety.

A highly desirable design feature of the LANROLL Attachment is the ability to remove the attachment from the shank by simply withdrawing the shank pin. By this means, machine tooling changes or attachment servicing can be accomplished without disturbing the original set up. This same construction facilitates, through the use of a gage, a precision, safe means for locating the attachment on the tool slide in respect to the high point of the machine's feed cam. Also, it allows attachment tipping to avoid indexing interference on screw machines having a limited tool slide movement. The same LANROLL Attachment will produce either straight or taper threads by using the proper rolls and an important but limited amount of auxiliary equipment. They provide wide range coverage while retaining the rigidity of a non-adjustable tool—assuring operation for every size within its range as though it were exclusively engineered for the particular work being threaded.

For complete information on the LANDIS Method of rolling taper threads and other outstanding design principles, please write and request Bulletin G-96.

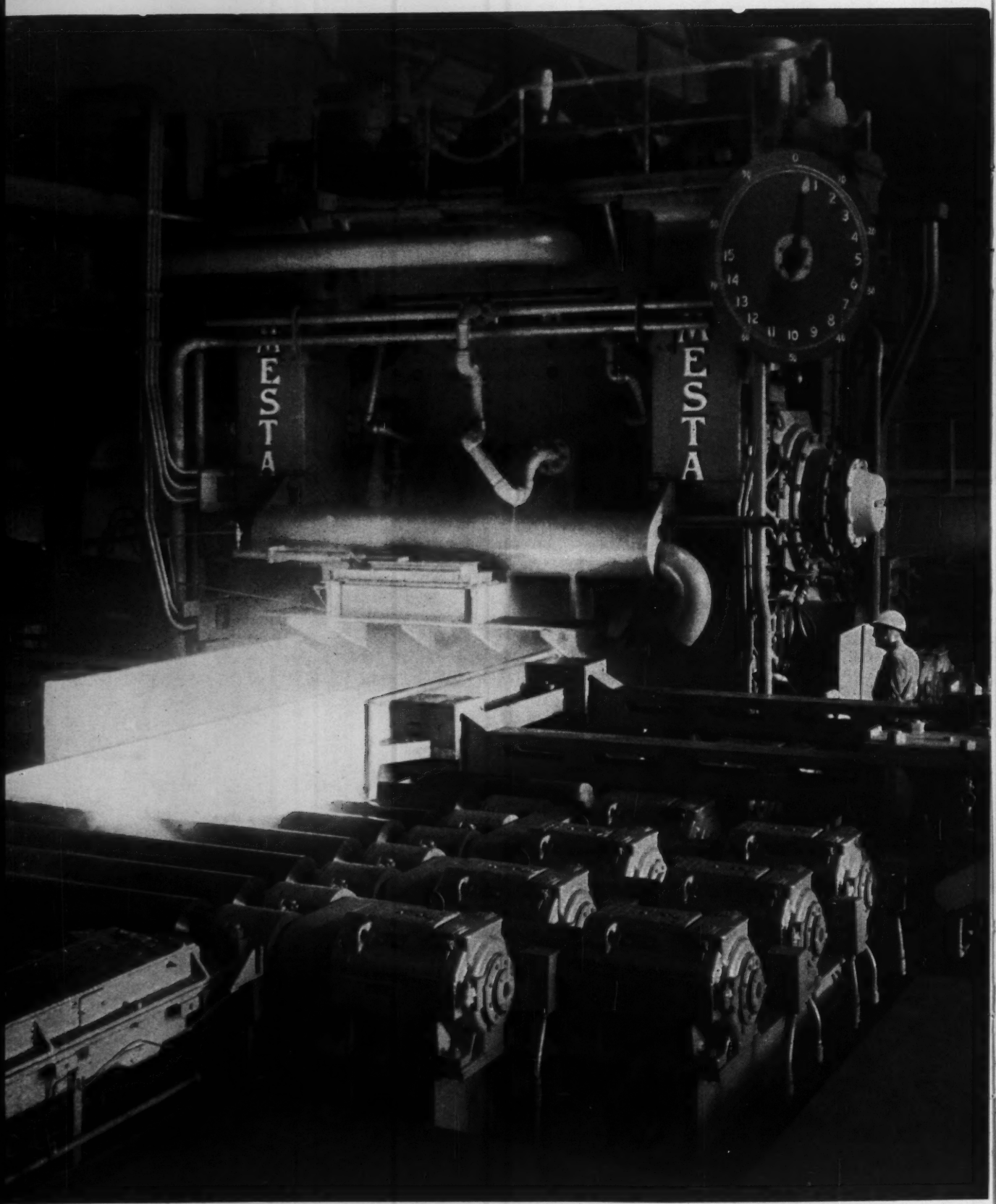




490C

LANDIS Machine COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.


ESTA
ESTA

Computer Controls make it

"AOK" AND "GO" ALL THE WAY at Gadsden

Just as with Project MERCURY, computers now help to assure top performance of the new, giant 134″ plate rolling mill of Republic Steel, Gadsden, Alabama.

From the time a hot slab of steel approaches the mill, until it emerges as plate, electronic computers are in charge, to produce plate sizes within new, remarkably exact limits. Only the console controller can cancel or alter the "flight" of material through the rolls. "Briefing" of the mill, via punch-cards, plots the course of material through a series of reducing and descaling stages—predetermining and governing each move.

The second phase of this major breakthrough will be accomplished with the installation of a new, programmed plate gage control—believed to be the first of its kind in steelmaking history. Called the PRESSDUCTOR, the new gage control utilizes a magnetic sensor located under the last roll to report back electronically to the computer whenever there is deviation. Corrections will be automatic, instantaneous.

Phase three will be the addition of even more sensitive front and back X-ray inspection devices to measure plate thickness. Here, too, signals will be transmitted electronically to the computer—assuring continuous, automatic accuracy.

These are examples of space age technology applied to make Republic plate production "AOK" and "GO" all the way . . . examples of greatest possible significance to Republic Steel users, in terms of quality and service.

GADSDEN PLATES

are produced to the following limits:

Sheared Plates . . . . . up to 92″ wide, and up to ⅝″ thick
Torch-Cut Plates . . . . . up to 84″ wide, and up to 2″ thick
Universal Mill Plates . . . up to 48″ wide, and up to 2″ thick

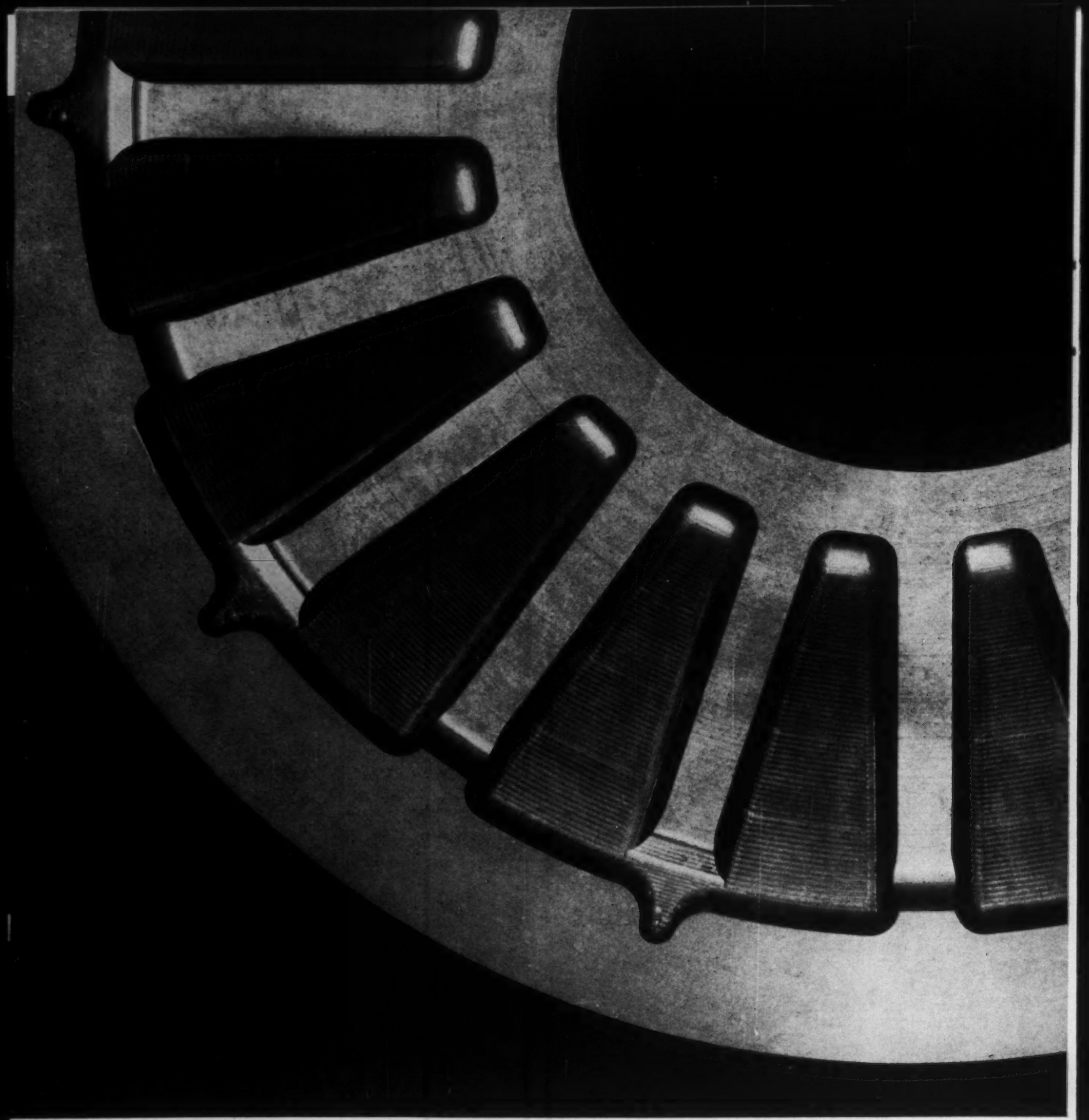
Steel
Strong
Modern
Dependable

REPUBLIC STEEL

REPUBLIC STEEL

DEPT. IA-2546 • 1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

REPUBLIC HAS THE FEEL FOR MODERN STEEL

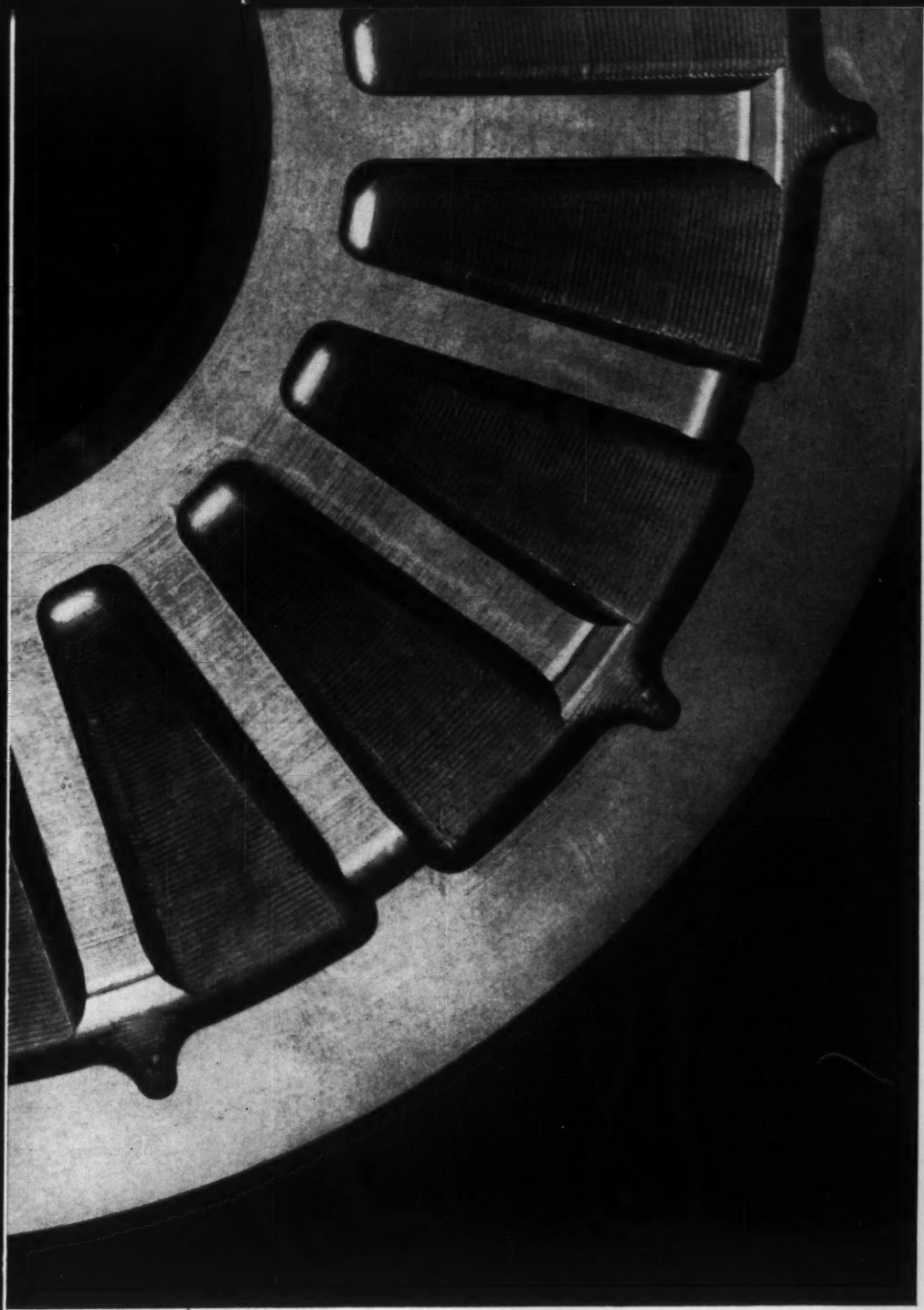


New IBM computer language...AUTOPROMT cuts milling time for this helicopter gearbox cover by 75%

AUTOPROMT (AUTOmatic PROgramming for Machine Tools) is a powerful new computer language designed to broaden the use of numerically-controlled machine tools.

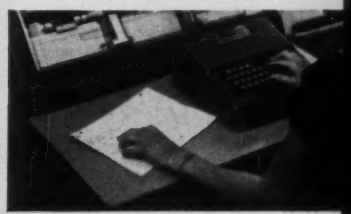
AUTOPROMT, for the first time, lets an engineer *describe the surfaces* of the three-dimensional shape he wants milled, *rather than calculating every path* the tool must follow in order to machine the part.

AUTOPROMT leaves to the computer the task of automatically generating these tool paths. You describe the part to be milled and the tool to be used in simple, *English-like*



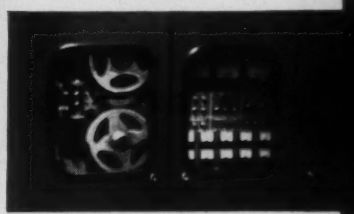
Here's the way AUTOPROMT works at United Aircraft Corporation

The Parts Programmer, using a conventional blueprint, prepares 180 one-line statements in AUTOPROMT language.



The statements are punched into standard IBM cards and entered into the IBM 7090 Data Processing System. (AUTOPROMT also works with the 704 and 709 Systems).

The 7090, programmed with AUTOPROMT, produces 8000 tool path instructions needed to direct the Pratt and Whitney Co. Inc. Numeric-Keller Continuous Path Milling Machine.



Punched tapes direct the Numeric-Keller Milling Machine.

The Numeric-Keller mills the helicopter gearbox cover.

terms. The computer does the laborious calculating work.

AUTOPROMT produces results like these: the time to mill the gearbox shown in the photographs cut to *one-fourth* the machine time required by conventional methods. AUTOPROMT reduced the lead time from blueprint to production *from three months to two weeks.*

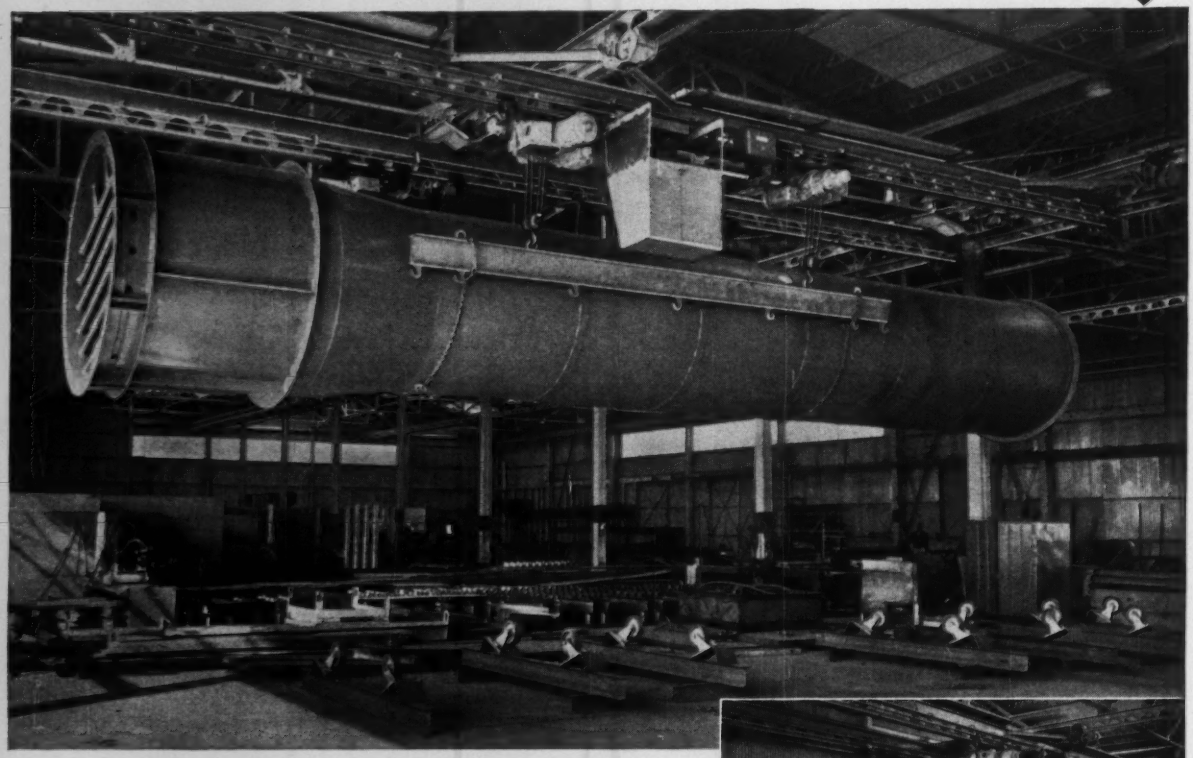
AUTOPROMT is available to IBM customers. Call your local IBM Representative for complete details on this latest advance in Numerical Control of machine tools.

IBM®
DATA PROCESSING

HUGE STACK HANDLED
with Light Tramrail Cranes

Two Standard Cleveland Tramrail Cranes Make Easy Job of Handling 11 Ton Stack

Two cab-operated Cleveland Tramrail cranes working together lift 11 ton stack. Each crane has two 5000 lb. electric hoists handling a spreader beam. Chains between the beams support the stack.

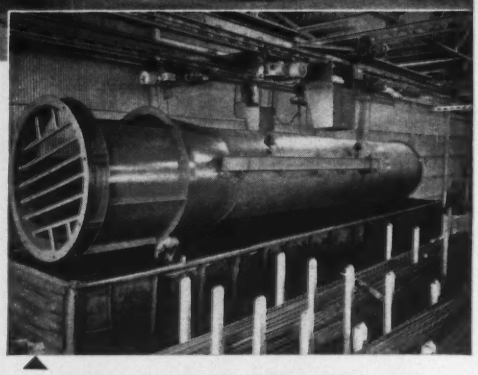


Cleveland Tramrail cranes are versatile in operation and offer handling advantages not normally possible with other forms of conveyance. They can be used to overcome difficult handling situations which occasionally arise and otherwise would be very difficult and costly.

The handling of a heavy stack made by Central Texas Iron Works Co., Waco, Texas, with two of their Cleveland Tramrail cranes, offers a good illustration. The cranes operate on the same three-track runway in one bay of the shop, are cab-operated and rated for five ton loads. Their principal function is handling large steel plates, bundles of reinforcing rod and various structural items.

The handling of the stack, nearly 50 feet long, weighing 11 tons, was not contemplated when the Tramrail crane installation was planned. Yet by working the two cranes together, the stack was easily lifted from the area where it was fabricated, moved a long distance in the shop high over various equipment on the floor and lowered into a gondola car at the end of the building. Despite the slight overload, the cranes moved the stack very smoothly.

For maximum materials handling flexibility, as well as efficiency, it will pay you to look into the possibilities of Cleveland Tramrail cranes.



The stack is lowered into the gondola car gently and accurately.

"WE ARE SOLD ON CLEVELAND TRAMRAIL"

Central Texas Iron Works writes:

"We are sold on Cleveland Tramrail because you build good equipment and because you are represented in Texas by a very fine dealer who is interested in helping us solve our material handling problems most economically rather than just trying to make another sale."

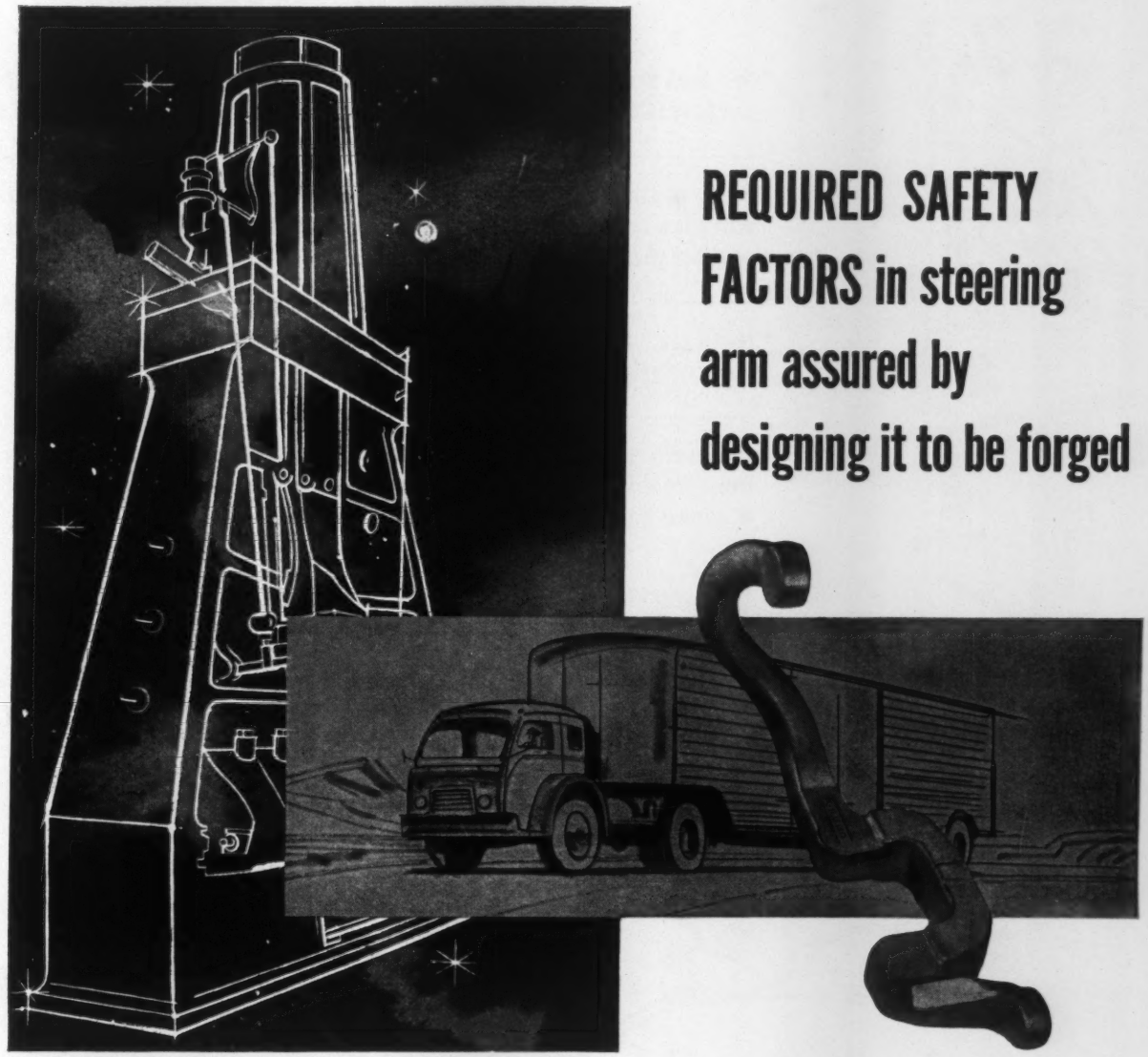
(May we add that all Cleveland Tramrail distributors have the same business philosophy).

Write for free booklet No. 2008

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4862 E. 290 ST. • WICKLIFFE, OHIO



REQUIRED SAFETY FACTORS in steering arm assured by designing it to be forged

Typical steam forging hammer

By designing with forgings, a truck manufacturer can count on the required safety factors, with minimum "beefing-up" of parts to offset unknown internal structures or non-homogenious materials.

You, too, can achieve results like these by designing *with forgings* either at the start or on re-design. The benefits of forgings are equally impressive, whether you make home-workshop equipment or diesel engines.

Forgings start as *better* metal . . . are further *improved* by the hammer-blows or high pressure of the forging process.

Write for literature on the design, specification, and procurement of forgings.

When it's a vital part, design it to be FORGED

Drop Forging Association • Cleveland 13, Ohio

Names of sponsoring companies on request to this magazine

"We had three carload returns of sheet last month, Harry. Bad surface. Cut-length rejections are killing us, too. 4.1% breakage."

"Well, Metallurgy has been telling me Foote Electromanganese will give us a better surface, more ductility. Reduce silicon and carbon pickup to practically zero."

"Hold it. Some of you guys don't seem to care what electrolytic manganese will do to my ingot cost."

"I'm with you, Sam. But I hear Foote claims that they can help quality and still cut the shipped cost of steel. I've got a stake in this. Let's let 'em prove it."

We'd be glad to! . . . We'll show you how Foote Electromanganese® can help control the cost of steel from pouring platform to loading platform. Yes, the cost of ingot may go up. But after this initial investment in quality, costs tumble. Electromanganese increases ductility. Rolling properties are improved, annealing cycle can be shortened. The secret is a simple one. Foote Electromanganese is pure manganese—99.9% pure. Carbon, phosphorus, silicon are almost not there at all. You make cleaner steels. Reject rate drops—so you sell more of what you make. And when your steel is shipped, returns are way down, breakage claims way down. Steels made with Electromanganese lead from strength, give you a better break on profits.

We will also make available to you a Foote expert—free. He'll assist in every way possible. Get in touch with your Foote representative—today, and write for your copy of Bulletin 201 which describes all the benefits in using Electromanganese. Foote Mineral Company, 438-18 West Chelten Avenue, Philadelphia 44, Pennsylvania.

FOOTE
MINERAL COMPANY

FIVE-DEEP

Millions in technology

help you profit with UCM's "FIVE-DEEP" Ferroalloys

1 Technology—many million dollars a year, invested in UCM's 600-man research and development center—helps you produce better, more profitable metals. This is one of the 5 intangible but ever-present extra values of Union Carbide Metals' FIVE-DEEP alloys.

It has brought you more than 100 new alloys and metals designed to give you production economies and improved products. Countless millions have been made and saved because of UCM's research, along with these 4 other extra values:

2 Customer Service brings you our integrated experience in the application of ferroalloys to various melting practices. Engineers from 9 UCM field offices travel a million miles a year to provide on-the-scene assistance.

3 Global Ore Sources assure you uninterrupted supplies of ferroalloys. UCM's close association with world-wide mines provides dependable raw material sources.

4 Unmatched Facilities free you from delivery worries. Only UCM gives you 6 plants—3 with their own power facilities—and 17 warehouses, all located for fast shipments by rail, truck, or water.

5 Strictest Quality Control—with over 100,000 tests per month from mines to shipment—makes sure you always get alloys of uniform size and analysis, with minimum fines, lot after lot.

For better metals, production economies, bigger profits, insist on UCM's FIVE-DEEP alloys. Union Carbide Metals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y., producer of "Electromet" brand metallurgical products.

"Union Carbide" and "Electromet" are registered trade marks of Union Carbide Corporation.

UNION CARBIDE METALS

Only **ELECTROMET** ferroalloys from **UCM** are so deep in extra values to help you.

Metalworking Newsfront 6

A GROWING MARKETING AID is commercial and industrial financing by manufacturers. Example: General Electric Credit Corp. In 1960 it doubled (to $63 million) it's financing of distributors, contractors and manufacturers doing business with GE. Business has been so lively that a separate division has been set up by the company to handle this type of operation.

"TRIAL BALLOONING" OF PRICES is detected by industrial buyers in the July survey of the National Assn. of Purchasing Agents. They see evidence of this in "selective increases and decreases in important commodities." Also noted in the survey: "Purchasing executives continue to show amazing resistance to inventory accumulation."

THE MARKET FOR ALUMINUM showed some shifts in the first quarter this year from last quarter 1960. Consumer durables took 10.7 pct of aluminum production, up from 8.8 pct. Machinery and equipment used 5.1 pct, up from 3.3 pct. Building products dropped to 19.9 pct from 20.6 pct, still the top single market.

AUTO PARTS BUILDERS get a "favorable outlook" rating from the investment service, Value Line. Three reasons for the rating are cited: The industry will share in the expected 20 pct increase in auto output; increased defense business for military trucks; and the trend to fully-equipped autos, even in compacts.

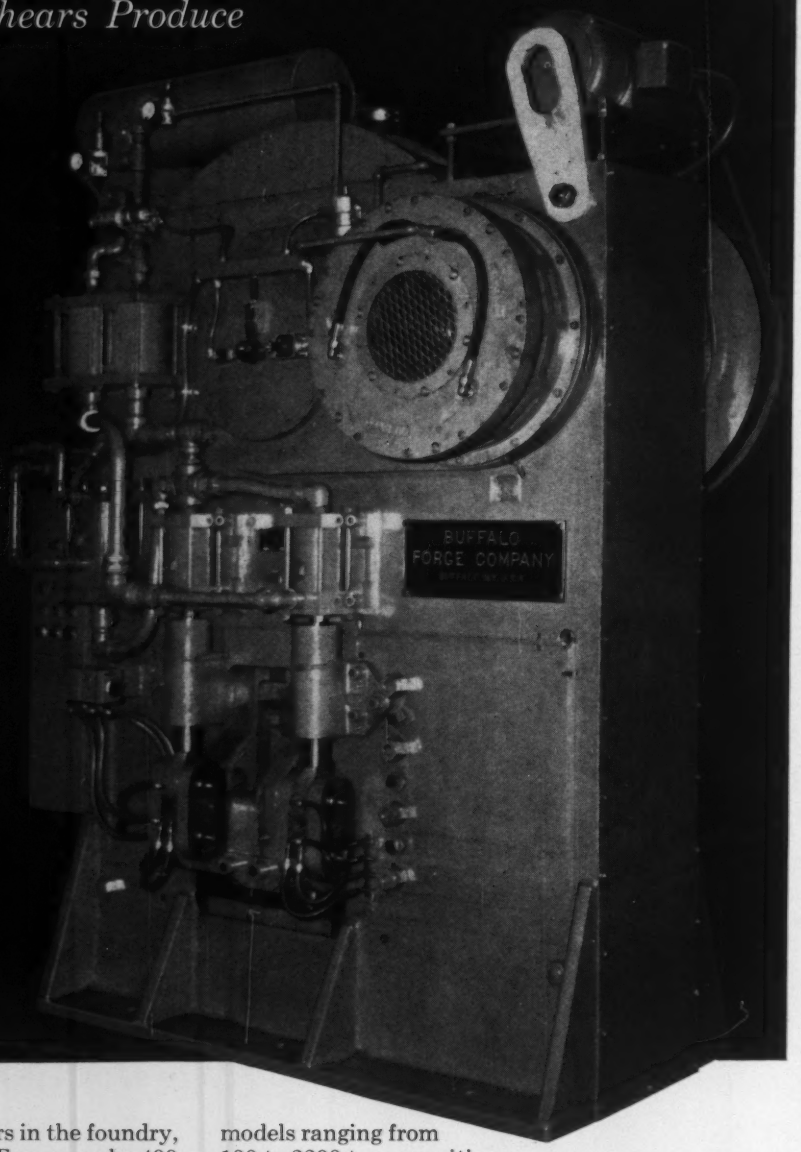
FEDERAL AID HIGHWAY FUNDS are expected to be apportioned to the states within a week. The funds, for the fiscal year 1963, will amount to $3.3 billion.

TELEVISION MAKERS FORECAST a big year with sales to top 6.2 million sets. The Electronic Industries Assn. reports current inventories held by producers, distributors and dealers are at a six-year low. Also, current production is running "well below" market requirements. Monthly production through May averaged only 435,000 sets; orders indicate a 680,000 set level.

INDUSTRIAL HEATING EQUIPMENT orders scored a big jump in June. Orders for the month totaled $9.6 million, up 117 pct from June 1960 volume. A big boost to the order volume is coming from foreign business, which is up 105 pct for the first half over the first six months last year.

'Buffalo' Billet Shears Produce

MORE CUTS PER BAR



The fastest-cutting production shears in the foundry, steel, and metalworking industries. For example, 400 ton model (illustrated) can produce up to 18,000 clean, square cuts (alloy steel) per eight hour shift.

Equally important... unique hold down and work support assure *maximum* number of cuts per bar with fewer rejects and minimum amounts of "unused" stock. Billets only 1½ times as long as their diameter can be cut in half... at full capacity in mild steel.

'Buffalo'Billet Shears are available in 8 standard models ranging from 100 to 2200 ton capacities. Rams are high strength alloy steel... adjustable knives are easily removed from rear of machine for sharpening.

Standard models include automatic air-operated oiling system, electrical equipment, and set of knives for round or square billets. Automatic feed tables are optionally available. Your 'Buffalo' Machine Tool dealer will be glad to furnish complete details. Or, write address below for Bulletin 711.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

MACHINE TOOL DIVISION

BUFFALO FORGE COMPANY

Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

Industrial Prices Face Stern Test As Economy Starts Upswing

First half of the year saw prices at their weakest and most chaotic in the postwar period.

By all rights, they can be expected to stage a strong recovery in the last half of the year. But will they?
By G. J. McManus.

■ With prices due to rebound from the greatest rollback in 20 years, purchasing men are checking bargain lists with extra care.

Buyers say the last six months have been the weakest and most chaotic for prices in the postwar period. Signs of firmness are starting to appear but no recent recovery has brought less assurance of real price strength.

At the same time, no recovery has had such a potential for fat increases. There has probably never been a larger gap between what suppliers are getting for their supplies and what they think they should be getting.

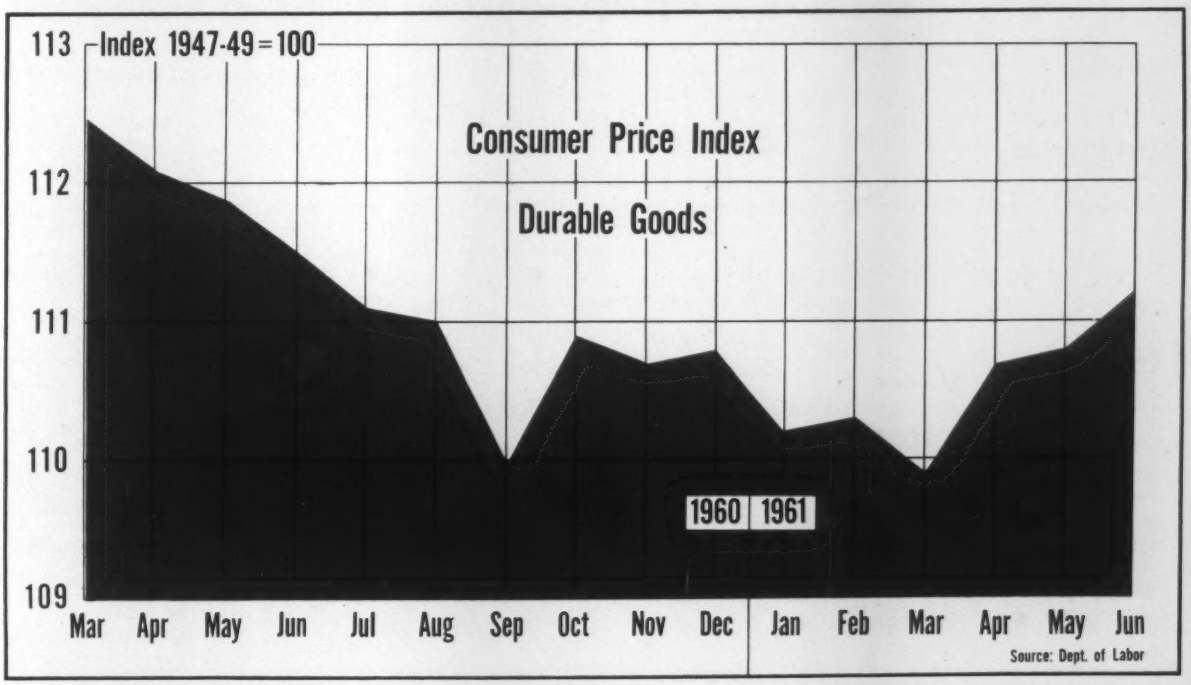
Bargain Season—This is true of nearly all products. But it is particularly true of those sold by some form of negotiation. Prices move up and down violently with demand for this group, which normally includes heavy equipment and other items specially built for customers.

Demand has been dismal for most negotiated products. The past eight months have been the worst for job volume since 1938, says R. W. Ewalt, sales manager, Rust Furnace Co. As a result, he says, heating furnace prices dropped below cost on the few contracts placed.

"You can get more for your dollar now than at any time in recent years," Mr. Ewalt says. However, he does not expect the bargain season to continue much longer. He thinks both prices and volume could move up sharply in September.

Prices Are Too Low—Buyers see the same possibility of sudden,

Durable Goods Prices Stage a Recovery



drastic action for a number of prices.

"We know we're buying a lot of items too low," says J. D. Rice, vice president and director of procurement, Koppers Co., Inc. (IA—July 13, '61, P. 59). "I have the feeling the turning point has been reached on structural fabrication, machinery and others where prices were too low."

Mr. Rice admits there is little evidence of a price surge so far. He points out, however, the penalty for slow buying reactions can be prohibitive. As an example, prices of structural fabrication can move up $100 a ton from the low point of a recession to the peak of a boom.

Mr. Rice is not inclined to gamble with numbers like these. He is placing orders as rapidly as possible for the steel mill Koppers is building for a Turkish group.

Signs of Recovery—Others agree there have been signs of price recovery. Molydenum prices moved up 12¢ to 14¢ a pound June 1. A 7¢ increase has been announced for nickel. The price of tin has jumped 30¢ a pound and is expected to rise another 10¢ by the end of the year.

Timken Roller Bearing Co. is putting through a 5 pct increase Aug. 1 for all except railroad bearings. Prices of electrical equipment have been firming up in recent weeks.

The moves are not taken as establishing a broad, powerful price trend. One steel mill looks for its buying costs to rise only 2 pct in the next year. "Our increases will be more nominal than in the past 12 years," says the purchasing director at the mill.

Structural Weakness—Others are less confident about the price future but all agree on one thing: Amazing price bargains are available now in many lines. One of these weak spots is structural fabrication.

"We've seen prices that are unbelievable," says T. A. Straub, president, Fort Pitt Bridge Works. "It's the weakest I've seen it in my time."

Mr. Straub cites a case where the lowest bid on a 5000-ton job was $900,000 under the next lowest.

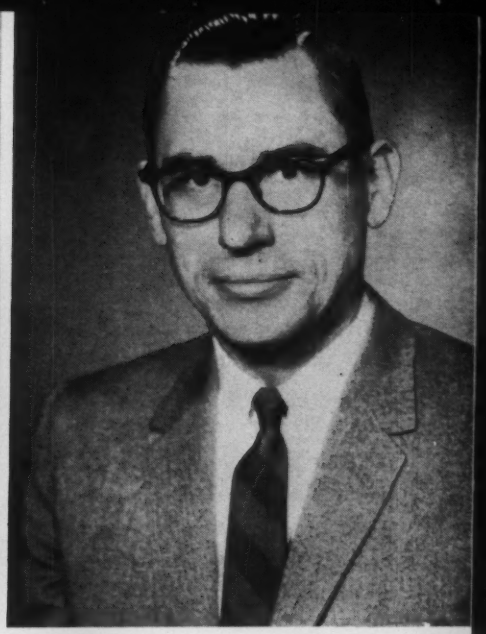
Mr. Straub is not optimistic about early price relief. With steel mills offering a plentiful supply of structurals and with no big push of industrial construction, he does

Commodity Prices: What to Expect

	What's Happened	What's Coming
Fabricated Metals		
Structurals	Down 15 pct. "Lowest prices in years."	Up 5 to 7 pct.
Iron Castings	Little or no price recovery in 1959. Prices now all over the map.	Labor costs go up this fall. But big price surge unlikely.
Forgings	Prices chaotic over past year and a half for open die forgings.	Little prospect of demand surge needed for price strength.
Metal Products		
Bearings	Prices firm and unchanged over past four years.	5 Pct. increase by Timken Roller Bearing, Aug. 1.
Valves & Fittings	Official prices unchanged since 1957; chaotic bidding in recent months.	"We think prices should go up. Whether they will or not is a question."
Equipment		
Electrical	Dropped to 30-40 pct below book. Some recent firming	5 to 7 pct increase.
Steel Mill Basic Furnaces	Little activity and hungry pricing.	Basic oxygen programs and foreign demand seen taking pressure off prices.
Heating Furnaces	Below cost pricing over last eight months.	Inquiries point to rapid price firming.
Metal Forming	Pricing "not too bad" but business lagging.	"Can't go any way but up."

KREOCH: "Whether they will or not is a question."

McCLOSKEY: "engineering and construction on a firmer base."



MARKLEY: "prices . . . will be influenced by labor . . . government.

not see any immediate prospect of strong demand or runaway prices.

Rolling Mills—Price prospects of rolling mills are analyzed along similar lines by G. G. Beard, president, United Engineering & Foundry Co. Users estimate prices of rolling mills have dropped 10 pct in the past two years. The idle capacity of certain suppliers has kept pressure on prices, says Mr. Beard; as backlogs accumulate, the economics of pricing will change.

"It's simply a question of supply and demand," he points out. "If business gets better, you're going to see prices rise."

Barring strong tax incentives, Mr. Beard feels it could be another 12 months before a big spending program develops.

Problems of Its Own—Electrical equipment has had the general recession plus its own special problems to contend with. On Attractive jobs, prices 30 to 40 pct below list were being quoted early this year. There has been some stiffening over the past month or two. The same kind of job is drawing bids about 15 pct off list.

"The pendulum went the other way after the antitrust cases," says an accounting executive.

Westinghouse Electric Corp. points to "soft prices" as one reason why earnings dropped 50 pct in the second quarter while sales were down only 2 pct from the 1960 quarter. Comparing 1961 with 1960, General Electric Co. had higher sales and lower earnings.

No Relief—For a wide range of products, there is plenty of cost pressure but no clear indication of price relief. Castings are one.

"Prices are horrible," says J. B. Dury, Jr., sales manager, Rosedale Foundry & Machine Co. "They're all over the map. On some things, prices are below what they were in 1955."

Forgings and Valves—"We're selling forgings at prices lower than they were five years ago," says J. P. Roche, president, Heppenstall Co. He says an extended period of heavy industrial demand is needed to relieve the pressure of overcapacity. He does not see this kind of market developing.

Official prices of valves and fittings have not risen since 1957. Increases are needed but competition on large orders has been rough in recent months.

"We think prices should go up," says P. C. Kreoch, vice president, sales — meter and valve division, Rockwell Manufacturing Co. "Whether they will or not is a question."

Services Are Firmer—Engineering and construction services are seen moving out of the period of minimum pricing. Drafting rooms are starting to fill up. Industrial construction is moving back into the picture.

"By September, you're going to see both engineering and construction on a firmer basis," says J. P. McCloskey, sales manager, Rust Engineering Co.

"As far as a price increase goes," says a refractory man, "We're in the same boat as steel. We're tied to the same labor pattern. We haven't had a general price increase since 1958."

As Demand Goes—Two other general factors are noted by H. E. Markley, executive vice president, Timkin Roller Bearing Co.

"The future of prices generally will be influenced by labor settlements and government policies," says Mr. Markley.

For some products, however, the outlook is simple: If demand goes up, prices will go up.

Steel Earnings on the Upgrade

But a Price Increase May Be Needed–and Coming

Industry leaders make it plain they believe a price increase will be needed to meet the next wage hike.

Outlook is for a continued improvement in third and fourth quarters. Ingot production of 100 million tons this year may be within reach.

By R. D. Raddant

■ Did Bethlehem Steel tip off a steel price increase in its second quarter financial statement?

At least, that's one interpretation behind the second largest producer continuing its dividend. After several quarters of not earning it, there had been wide rumors that Bethlehem would cut its 60¢ quarterly dividend. But even though second quarter earnings of $25,996,185 fell short of the mark, the payment was continued.

Improving Markets—The reasoning, as explained by Arthur B. Homer, chairman, is that Bethlehem's confidence in improving markets and earning potential justified continuation of the dividend.

This, of course, does not spell out a price increase. But Mr. Homer made no bones about his feelings. "We need a price increase," he said. "It's coming to a head in October and will have to be given careful consideration."

Who's Afraid?—At the same time, he scoffed at comments that the industry was "afraid" of Washington reaction to a price increase.

However, it's still doubtful if the industry can make a general price increase stick unless the market tightens. U. S. Steel's chairman Roger M. Blough made this cautious comment:

"There is no change in the position that we have maintained in the past that prices are determined by market conditions, costs, and competition."

100 Million Tons — Besides bringing on more price speculation, quarterly reports and comments on earnings reaffirmed industry confidence in a continued market improvement. Mr. Homer renewed an earlier prediction that total ingot production this year would approach 100 million tons. Mr. Blough's analysis was something like 98 million tons.

Avery C. Adams, chairman of Jones & Laughlin Steel Corp. said, "Prospects are now that our sales for the last half of 1961 will be at least 20 pct higher than those for the first six months."

Both Mr. Blough and Mr. Homer used the word "gradual" in forecasting the second half improvement.

Who Gained—A check of second quarter earnings shows that the industry fared well generally, while operating at less than 70 pct of capacity. Ten of the 18 major companies reported better earnings for the second quarter of 1961 than for the same period of 1960. Improvement over the first quarter was generally unanimous.

Another note: Capital spending outlays by most companies remain large, although programs for which appropriations are already made show a moderate drop from a year ago. These programs generally involve oxygen installations, raw materials, and finishing capacity. No gain in overall capacity is planned except as incidental to improvement of existing facilities.

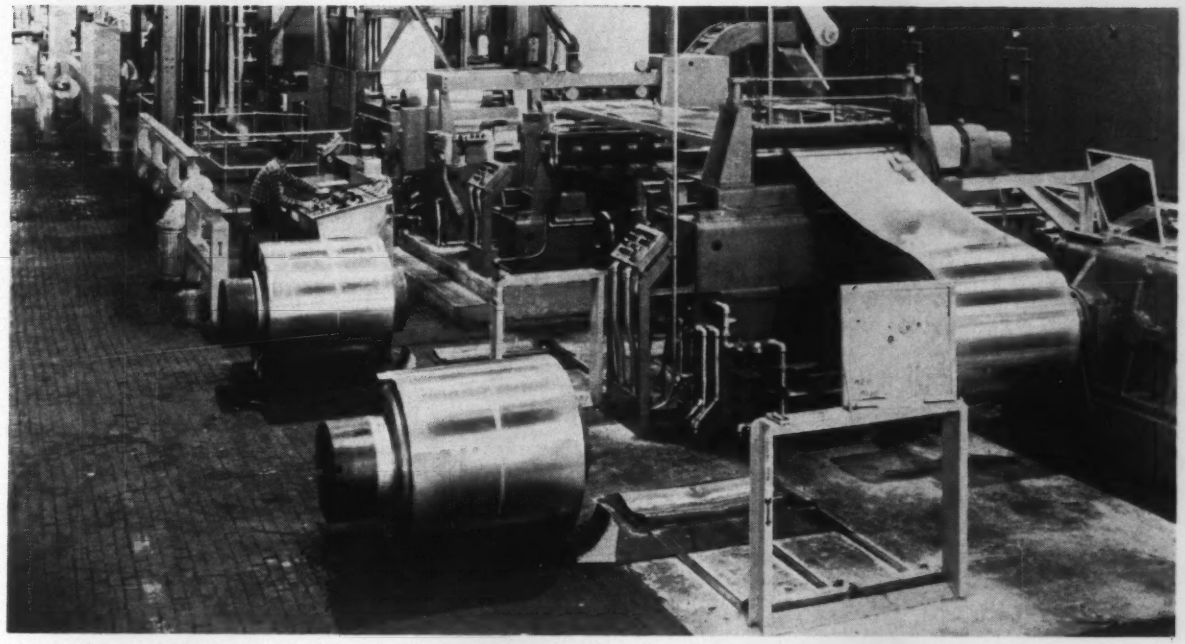
With second quarter earnings in comparatively good shape, the outlook is for significant improvement through the final half of the year. Many steel executives also believe that the defense picture, with more emphasis on "conventional" weapons, will be an assist later this year and into 1962.

Steel Earnings: 1961 vs. 1960

Not a Bad Quarter for Many

COMPANY	SECOND QUARTER 1961	SECOND QUARTER 1960
U. S. Steel	$59,027,471	$80,893,489
Bethlehem	25,996,185	29,714,308
Republic	15,431,357	13,168,938
Armco	13,915,522	17,775,225
Inland	13,605,988	14,323,569
National	10,302,140	9,583,019
Jones & Laughlin	9,240,000	8,342,000
Youngstown Sheet & Tube	8,163,845	5,997,762
Kaiser	6,269,686	188,264
McLouth Steel	4,991,476	3,848,333
Allegheny-Ludlum	2,860,892	741,000
Granite City	2,627,530	3,330,896
Wheeling	2,127,000	2,609,000
Colorado Fuel & Iron	1,856,605	432,260*
Universal-Cyclops	1,502,382	1,034,832
Lukens	1,378,000	963,000
Detroit Steel	418,086	667,858
Pittsburgh Steel	208,285*	237,617
Alan Wood	151,781	350,150
Crucible Steel	149,000	309,000

* Net loss.



SMOOTH AND FAST: Aluminum coil is processed for canmakers on special new unit at Kaiser's Trentwood works.

Aluminum Can Stock Tailor-Made

Kaiser Aluminum is completing a fully automatic line to process aluminum sheet and coil for canmakers.

New line, which will cost about $2.5 million, shows how heavily aluminum producers are banking on the can market.

■ Aluminum makers are in the can market to stay, and are backing up this determination with man-size capital spending.

Up to now, aluminum can stock has been commodity-priced, and probably will be for some time. But new facilities designed to bring costs down to the 28¢ per lb price for can stock aluminum are coming into the picture.

Fully Automated — Last week, Kaiser Aluminum & Chemical Corp. announced a fully automatic facility to process aluminum sheet and coil for canmakers. The facility, costing something like $2.5 million, follows a two-year construction and development program at Trentwood, Wash. The complete facility includes a degreasing and flattening line, a coating line, and classifying line.

The facility is based on Kaiser predictions that 100 million lb of aluminum will be used in the can market this year. Use in 1960 was about 40 million lb, but breakthroughs, particularly in the frozen citrus market, resulted in the 60 million lb gain.

Rate of Gain—John F. Delany, manager of can sales markets for Kaiser, said he is convinced that aluminum makers will be able to hold this rate of gain for at least several years.

With the frozen citrus market assaulted, aluminum is now taking aim at the tuna fish market. This is a logical step because the shallow tuna can can be drawn.

Tinplate Fights Back — Meanwhile, steel companies with the new thin tinplate are fighting back in the frozen citrus market and are making their own developments to hold down aluminum's gains.

Mr. Delany estimates that 49 million lb of aluminum will go into the 1961 frozen citrus market, or 50 to 70 pct of the entire pack. He believes aluminum will control 90 pct of the 1961-62 pack. The tuna market of some 700 million cans a year is a potential market of 30 million lb of aluminum can stock.

Another market that Kaiser's new facility is taking aim on is the composite can with metal ends. Aluminum has penetrated to the extent of 20 pct of this market.

The aluminum can stock price of 28¢ per lb for coils and 30¢ for sheet is controversial. This is only 2¢ per lb over the price of primary aluminum ingot and many think it is unrealistic, even for commodity pricing.

But Mr. Delany says that with the new facility, the company can show a profit, even at that level.

Industry Learns New Languages

Courses Pave the Way to Better Business Abroad

Industry now attaches more importance to executives learning the language of the country they are doing business in.

Major firms are helping in this project as businessmen start back to school.

By F. J. Starin

■ An executive of a company in New York City can be seen these days chatting amiably, but intensely, with the same companion on the train home each evening.

When the train reaches Westport, Conn., a trip of about an hour, the pair get off and bid each other "adieu." Then the companion goes around to the other side of the station and takes the next train back to New York.

Reason for this unusual ritual: The businessman is going to France soon to transact some business. He wanted to learn French, but had little or no spare time.

His train companion is a French instructor from the Berlitz School of Languages.

Unusual Case — Robert Strumpen-Darrie, president of Berlitz, admits this is not an average case. Most students study in the classrooms of some 200 branch offices in North and Central America, and the West Indies.

But this does indicate the importance U. S. industry now assigns to learning the language of the country in, or with which, it does business.

Mr. Strumpen-Darrie says Berlitz's business has more than tripled since 1953. And the percentage of students from business and industry has grown at the same rate.

Many Enroll—In New York, 23 pct of all students come from business and industry.

Estimates from some branches in highly industrialized areas run as high as 60 pct at times. The official Berlitz figure for New York counts only students whose bills are paid by the company. So the total is probably higher.

Other language schools agree with the Berlitz estimate of industry's growing interest in languages.

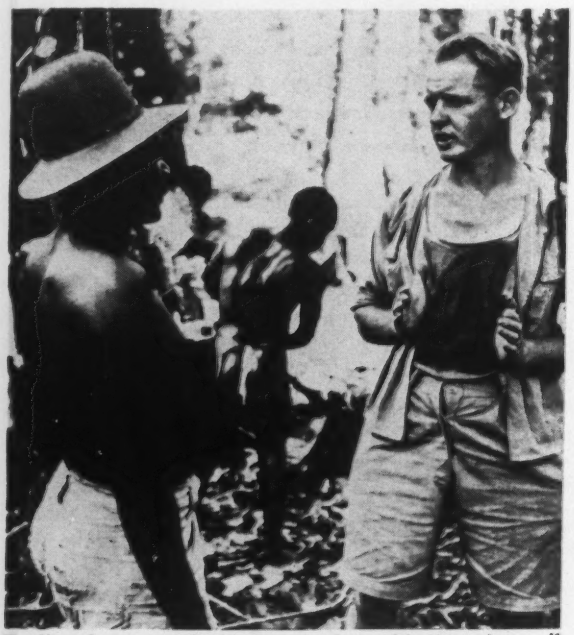
Linguaphone Institute sells a home course that includes records and text books. It figures businessmen make up the largest single category of customer.

Broad Front—There are some good indicators that this trend takes in a broad business front.

Anaconda Co., with copper mines in Chile, has people studying Spanish.

Aluminum Co. of America, with bauxite holdings in the Carribean, has people learning Spanish and Portuguese.

CLASSROOM TO CONGO: Students may learn a foreign language in the air-conditioned comfort of a Berlitz classroom. But many, such as this American oil company worker, must then put it to use in the field.



Crucible Steel Co. sent an executive to school to learn Italian when it bought an interest in a steel plant in Milan.

International Telephone and Telegraph has people taking Spanish and Portuguese. Standard Vacuum, a major oil company with world-wide operations, has enrolled men in Indonesian, Japanese, Hindustani, Malayan, Spanish and French courses.

Prominent List — Linguaphone boasts an extensive list of distinguished clients, including Reynolds Metals Co., Ford Motor Co., General Electric Co., and American Smelting & Refining Co.

Favorite languages, at both Berlitz and Linguaphone, are French and Spanish. Of 300,000 students taught by Berlitz last year, almost one-third learned French, with only a slightly smaller group taking Spanish.

Berlitz offers 38 languages. But it will teach almost any language for which there is a demand, and for which they can find a native.

Record Value—Linguaphone, on the other hand, offers both Latin and Greek in their list of 39 languages.

The company says one advantage of records is that the student always has them for review. And more than one person can use them.

Linguaphone also maintains an advisory service for questions about a language that might not be answered in the course.

There are definite trends in this new venture by industry. Perhaps most important: More companies are discovering the value of having the wife of an overseas-bound employee learn the new language.

Another Trend—Berlitz has tailored some courses for specific industries. The method is the same. But the vocabulary emphasizes the nomenclature of the industry.

In steel, for instance, this might include such as scarfing, soaking pits, tapping a heat, etc. The company now has tailored courses for 15 different industries.

Price Controls: Move First, Argue Later

Administration is setting up machinery to clamp controls on prices swiftly—if needed.

The President will act first, then argue the validity of his actions afterward.

By R. W. Crosby

■ President Kennedy has struck a match near the kindling of Federal price controls. And industry should note that the kindling is very dry.

"If things get too hot," an economic adviser of the President told The IRON AGE, "I think price controls of a wartime nature would be invoked by the Administration."

The fire is already lit under steel industry price controls. Several studies of steel prices are being made at the President's request.

Soft Warning—One study, made by the Council of Economic Advisers, will be ready any time the President wants to use it as a persuader. The IRON AGE learned that the conclusions of the study, based on production and the economy today, do not justify any steel price increases.

In the soft words of a government economist, the conclusion is that: "It would be better if the steel industry did not raise prices at this time."

The major reason behind this conclusion and, also, behind price controls in general is the crisis over Berlin and other trouble spots. "Control of prices, steel prices, particularly," the economist says, "may not be industry's fault, but in a time of crisis we just can't have price increases."

From the President—The President's Labor-Management Committee is also making a study of prices.

If these Administrative studies were not enough warning, there are the words of the President himself, the words of price control experts who have been visiting the President, Defense Dept. studies, and even the ideas of some Republicans.

President Kennedy spoke to the nation last week in war-like tones. He pointed out that if he feels he needs more "controls or other new powers, I shall not hesitate to request them."

Price Control Experts—The IRON AGE learned that leaders of the World War II Office of Price Administration (OPA) have been called in to the President's office.

In Defense Dept. studies of the impact on the American economy of a limited war in Berlin or elsewhere have already mapped out procedures for price controls. These plans have been put on the "mobilization shelf" and can be put into effect in short order.

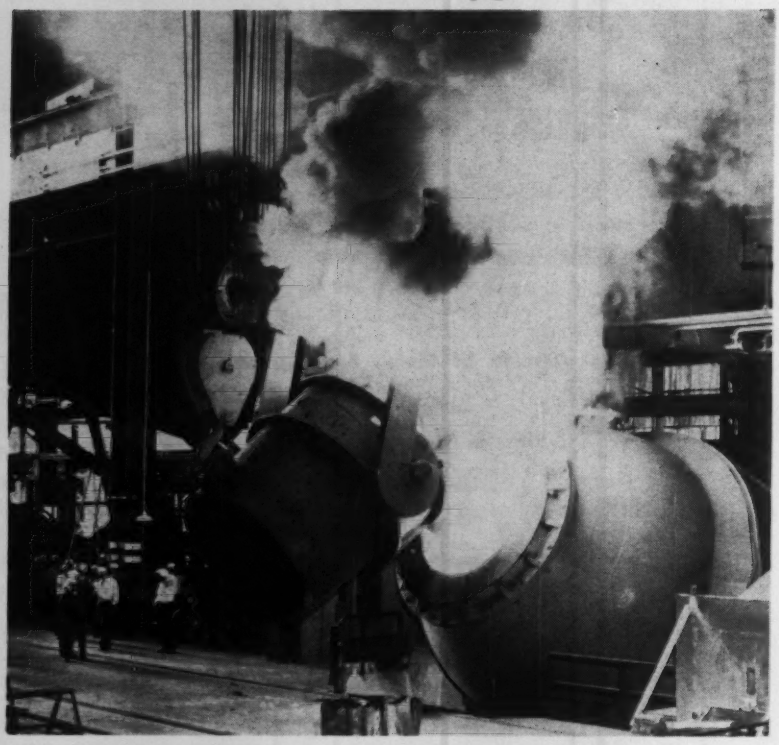
Have Ideas—Even Republicans have price control ideas. Only here the approach is much softer. Sen. Kenneth R. Keating (Rep., N.Y.), wants the Commerce Dept. to start a national campaign urging industry to voluntarily hold down prices.

The Berlin crisis, which has already sparked a huge defense spending increase, could spark price controls.

Ready to Go—In past wars the White House asked and got price control quickly enacted by the Congress. Administration insiders say now that they may not bother with such formalities.

If the Administration feels the need exists, it will act swiftly and boldly—and argue about the validity of its acts later.

Test Colorado's New Oxygen Furnace



BOTTOMS UP: Molten iron is poured into the furnace during the first test of Colorado Fuel & Iron Corp.'s new basic oxygen steel plant in Pueblo, Colo. It's part of a $21 million modernization program.

Steel Service Centers Expect An Upswing

Steel service centers are looking for a good increase in business during the second half.

Robert G. Welch, executive vice president, Steel Service Center Institute, said in Chicago last week: "The consensus of industry leaders is that second half sales will be 15 pct ahead of the same period last year. This will equal, or slightly exceed, last year's total."

He added that "Some of our members are more optimistic. They see a net gain over last year of 10 or 12 pct." These members feel the gain will come from:

1. Greater emphasis on conventional weapons.
2. Potential business from machine tools and capital goods where purchasing has been delayed pending depreciation reform.
3. Price hedge buying.
4. Inventory buildup by fabricating plants.

Less Shipments—Mr. Welch said July shipments were slightly less than June. But he attributed this to the July 4 holiday. However, July shipments were ahead of July, 1960. On a day-to-day basis, shipments are considerably higher.

He noted that warehouse inventories now are at 2.8 million tons—down from the three million tons in March. He said they have declined at about 15,000 tons per month.

Name New President At Chrysler Corp.

L. L. Colbert, chairman and president of Chrysler Corp., resigned both top positions last week. Lynn A. Townsend, administrative vice president, was named president by company directors. He joined Chrysler as controller in 1957.

The move leaves the third largest automaker without a chairman of the board. However, directors set up a new executive committee made up of directors from outside the company and Mr. Townsend.

It is headed by George H. Love, who is also board chairman of Consolidation Coal Co. and M. A. Hanna Co., and a director of National Steel Corp. The company said he "will take an active part in Chrysler Corp.'s affairs."

Mr. Colbert, however, has not broken all ties with Chrysler. He was made chairman of the board of Chrysler of Canada, Ltd., a subsidiary located in Windsor, Ont., across the Detroit River from the automotive center.

Will Aluminum Price Hold Until Fall?

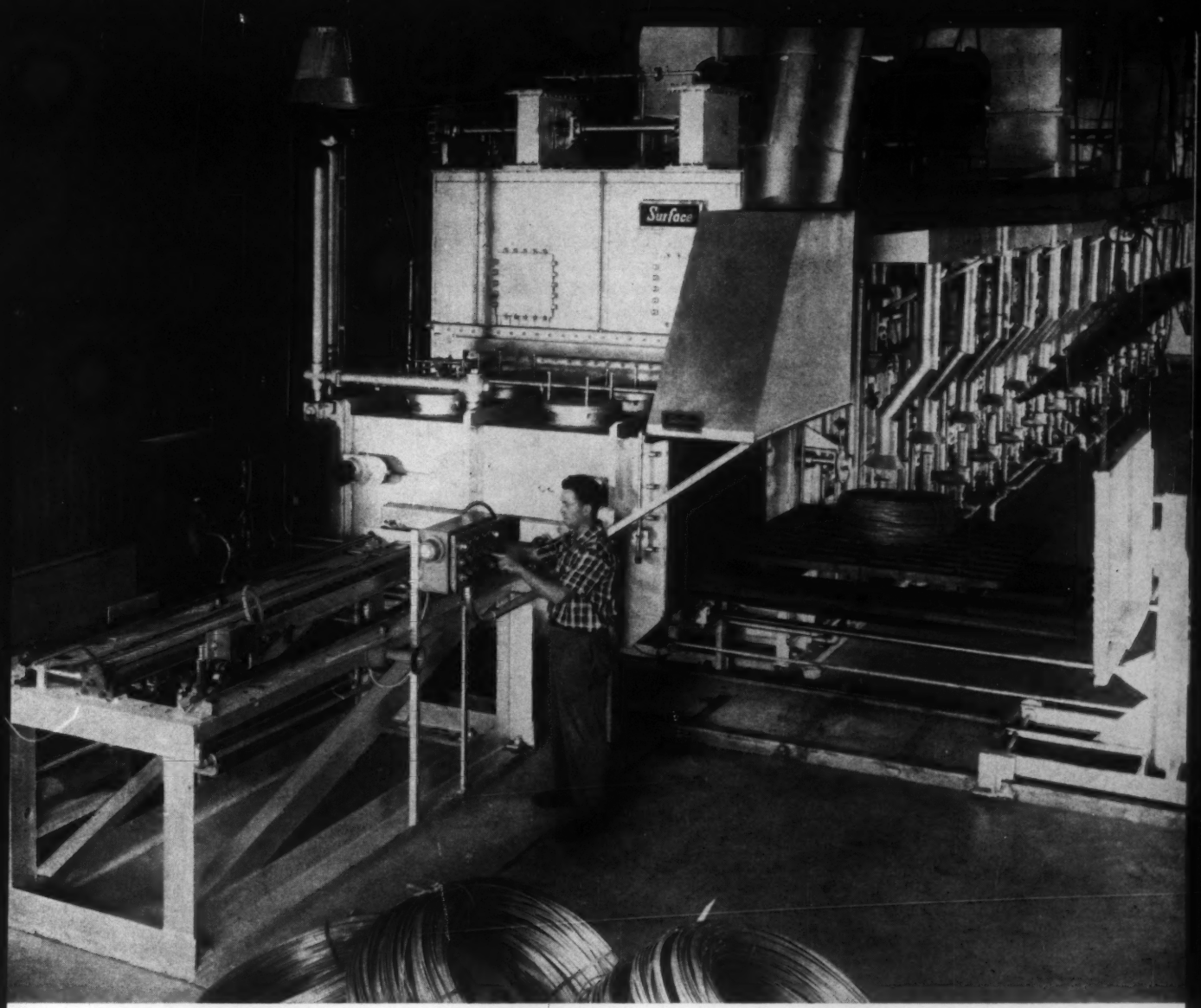
No immediate price reaction is expected from the pay hike applied Aug. 1 for aluminum workers.

Aluminum Co. of America estimates this latest increase will cost about 13¢. This is made up of 8.8¢ for direct pay, 3¢ for cost of living. The rest is the impact of pay additions on overtime, vacation and similar charges.

During the contract, aluminum prices have shown little change. There was an increase of 1.3¢ a pound for primary aluminum in December of 1959. However, this merely cancelled out an earlier reduction. It brought the primary price back up to 26¢ a pound, where it was in 1957.

In August of 1960, at the time of the last pay hike, Alcoa initiated increases for most mill products and for some grades and sizes of ingot. It was estimated the boosts ran between ½¢ and ¾¢ a pound.

General feeling is that aluminum producers will delay until September or later before acting on prices. There is still strong competitive pressure on prices. There is uncertainty about steel prices. Also, early returns indicate the industry may be finding ways to trim costs or create greater price firmness.



Wire inventories reduced by 80% and delivery time cut from months to days

That's the report of the Butcher and Hart Manufacturing Company of Altoona, Pennsylvania. Manufacturers of wire fasteners, Butcher and Hart installed a wire drawing line and a Surface continuous annealing furnace so they could fabricate their own wire and insure its workability for drawing and cold heading operations.

The 100 foot furnace is used to spheroidize the wire between drawings and control carbon for subsequent operations. Only two men operate the entire drawing and annealing line. The consistent and accurate system is composed of the air tight furnace, economical gas generation, and automatic control of carbon content.

The continuous line furnace has carburizing, carbonitriding, skin recovery, annealing, and spheroidizing capabilities.

Write for information: 2373 Dorr St., Toledo 1, Ohio. In Canada: 2490 Bloor St., West, Toronto.

SURFACE

SURFACE COMBUSTION, Toledo 1, Ohio/ a division of Midland-Ross Corporation MR

INDUSTRIAL BRIEFS

Award of Merit—T. E. Eagan, chief metallurgist, Cooper-Bessemer Corp., Mount Vernon, O., received the award of merit from the American Society of Testing Materials, at the annual meeting.

Ore Ship Away—The S.S. Leon Falk, Jr., newest lake ore carrier of the National Steel Corp. fleet, was christened at Cleveland. The fleet is run by M. A. Hanna Co.

Valve Hookup—Golden-Anderson Valve Specialty Co., Pittsburgh, has purchased Rotary Valve & Engineering Corp., Birmingham, Ala. The name of the new subsidiary has been changed to Rotary Valve Corp.

Full Line—Electronics & Instrumentation Div., Baldwin - Lima-Hamilton Corp., has purchased full rights to a new line of microminiature differential amplifiers from R. E. Stanaway Associates, Pasadena, Calif. B-L-H will make the units an integral part of its strain gage transducer line.

New Entry — Kleber Laboratories, Inc., has been formed at Burbank, Calif. The new company will make instruments to detect and analyze beryllium and other light metals.

Stock Merger—General Magnetic Corp. has affiliated with the Muter Co., Chicago, in an exchange of stock. As a new subsidiary, General Magnetic will continue to make permanent magnets for many industries.

Name Change—Maryland Pipe & Metals Co., Inc., is changing its name to Maryland Metals, Inc., with headquarters at Hagerstown, Md.

Navy Contract—Ingersoll Kalamazoo Div., Borg-Warner Corp., received a $3.25 million contract from the Navy's bureau of ships to produce 550 spur gear final drive assemblies for amphibian tanks.

All Together—Perfect Gear & Instrument Corp. has combined administrative and sales offices with manufacturing and test facilities in a new building at Inglewood, Calif. Perfect Gear is a subsidiary of Liberty Electronics Corp.

Three - in - One — Three scrap yards in LaPorte County, Ind., have merged to form the largest operation of its kind in the state. They include Indiana Salvage Co. Div., Northern Indiana Steel Supply Co.; Waste Material Corp.; and Maple City Steel Supply Co. Main operating yards are at Michigan City, Ind.

Electronics Pool—Beckman Instruments, Inc., Fullerton, Calif., is merging with Offner Electronics, Inc., Schiller Park, Ill. As a new subsidiary, Offner will enlarge Beckman's medical, industrial and space instrumentation lines.

Extra Division — Eastern Products Corp. has established a new metal finishing division, with main plant at Baltimore. It will produce pre-painted coiled steel and aluminum in many gages and widths.

Now Rolling—A new company, Rolling Mills, Inc., has been formed at Syracuse, N. Y. It will design and manufacture steel mill equipment, metal forming machinery and process lines.

Major Growth—Hutchens & Son Metal Products, Inc., Springfield, Mo., is expanding its subsidiary, Marshfield Steel, Inc., at Marshfield, Mo. With a new plant, Marshfield will assume all manufacturing responsibility for Hutchens' spring suspension systems.

Combined Activity — Standard Automation Corp. has combined activities with Eglinton Carbide Products, Inc., at Wyandotte, Mich. Standard has added metal cladding to its stamping facilities. Eglinton supplies precision carbide dies for the electronics industry.

Hotel Steel—Bethlehem Steel Co. has received a contract to supply 20,000 tons of steel for the new New York Hilton Hotel being built at Rockefeller Center.

Computer Complex — General Electric Co. is building a $1.5 million, 39,000-sq ft computer laboratory at Sunnyvale, Calif. Other computer centers will be opened by the company this year at Schenectady, Chicago, Washington and New York.

Culvert Spread—Wheeling Corrugating Co., subsidiary of Wheeling Steel Corp., is building a $500,000 culvert fabricating and bituminous dipping plant at Jeffersonville, Ind. Another culvert plant will be built at Havana, Ill.

Tractor Center—J. I. Case Co. is building a new wheel tractor engineering center at Racine, Wis. It will use the company's test area and chemical and strain gage testing equipment.

Porter Opening — Delta - Star Electric Div., H. K. Porter Co., Inc., has opened a new plant at Lynchburg, Va. It is producing distribution transformers, lightning arresters and industrial crane conductor systems.

First of Five—Air Products, Inc., Allentown, Pa., has placed on stream the first of five tonnage oxygen plants scheduled for this year. The new facility at Granite City, Ill., will produce liquid and gaseous products.

Identical Build — Rust Furnace Co., Pittsburgh, has built three identical five-zone slab reheating furnaces for Bethlehem Steel Co.'s 56-in. hot-strip mill at Sparrows Point. Each furnace can produce more tons of heated slabs per hour than any other existing furnace.

Atlas Growth—Atlas Steels Ltd., of Canada, has acquired Alloy Metal Sales Ltd. from the International Nickel Co. of Canada. Atlas is also building a 60-ton vacuum degassing unit and continuous bright anneal furnace at the Welland, Ont., plant.

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DELAYED REPORT

By this time we *should* be able to tell you how long the oil clutch will last in a Hyster industrial truck. We can't. Our problem is that we have been using and testing these clutches for three years, and we haven't worn one out yet!

This type of oil clutch is new to industry—and it's an exclusive feature on Hyster lift trucks. With a lift truck's work day involving hundreds of inch-at-a-time moves, coupled with more backing and filling than a boat making harbor, this rugged, trouble-free clutch solves a long-standing problem.

By cooling the conventional clutch plate in a spray of oil, Hyster has extended clutch life to a measured 10,000 hours—plus! Check *that* figure against other clutches. Then, if you have a material-handling job, call your Hyster dealer. This is the line that sets the engineering pace for all lift trucks.

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Keep Training Plans Up-to-Date

Your management quality tomorrow depends on the quality of today's training programs.

But it's important to keep management development from getting static. A change in thinking is needed.

■ What holds your company together and keeps it moving forward? Sound research? New products? Efficient production? Aggressive marketing? All are important.

But in the final analysis, companies stand or fall on the quality of management. More than ever before people mean the difference.

Industrial and technical advances have increased this trend. Harold Mayfield, director of personnel relations, Owens-Illinois Co., explained how during a recent training conference at Cornell University.

Only Men Differ—"With each passing year," he said, "it's clearer corporate survival and progress ultimately depends on the effectiveness of the working force. This is more apparent now because of the dwindling away of former protections—patent advantages, marketing agreements, tariff walls, and the diminishing importance of geographic barriers through improved transportation.

"Today most companies are in a competitive race with few built-in advantages. Each has access to the same machines, the same sources of supply, and the same customers."

The result? "Through necessity the energetic businessman turns to his work force in seeking ways to improve the effectiveness of his organization. And he is taking a special look at the management core around which the rest of the organization is formed."

Don't Stand Pat—Study of management brings up the question of management development programs. Even if your own program is effective today, you can't afford to stand still. Constant review and improvement are a must.

What's needed in management training? Discussing this question in the Atlanta Economic Review, Robert K. Greenleaf, director of personnel research, American Telephone and Telegraph Co., calls for a change of thinking.

Try A New Look—"Something more than what is usually thought of as a 'management development program' will be required—something more than courses, replacement tables, and schedules of experience, useful as these are if well done. The 'something more' is a change of thinking, a better way of looking at the problem."

The key to successful management development doesn't rest with the details of a training program, Harold Mayfield warns. "It rests in the interest generated in managers to help their people develop."

He adds meaningfully, "One of the best ways to teach people good management is to allow them to see some of it."

Watch for These Pitfalls

■ If your aim is developing more and better managers you must plan for specific action.

Five major areas are suggested by Robert Greenleaf for improving management development: State compelling company goals. Follow less tradition and more theory and experiment. Provide effective formal classroom training where needed. Supply adequate staff support. Clarify senior manager understanding.

Common Failings — On classroom training he suggests watching out for these danger signals: Pressure to do the pleasant and the popular. The tendency for things to crystallize and become static under repetition. The illusion that development needs can be fully met by formal training alone. The failure of the boss to make clear what he expects from the training. Failure to demand an accounting of the trainee's performance.

Summing up, he observes, "Continued progress in management development depends upon improving awareness and performance in all of these areas." The big question is, "How much improvement and how fast."

This depends, he says, on what kind of feeling the older people in management have about the younger people. This, in turn, will decide if present managers are willing to be experimental and venturesome in developing understudies.

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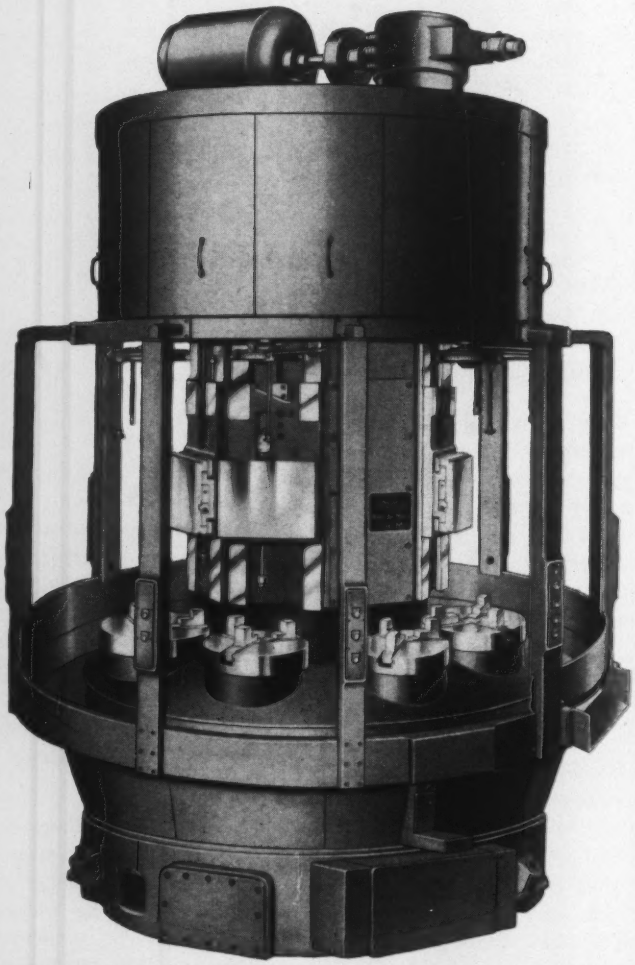

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1962: Greater Auto Variety

Automakers are used to setting trends. But it looks like the 1962 cars will all be out to meet public demands.

The big feature of the automakers will be a greater variety of models, sizes and extras.
By A. E. Fleming

▪ The auto industry is one of trends. And there will be several to look for in the 1962 model year.

The move toward variety will be greater than ever. There will be variety in engines, interiors and models.

What looks like a real Donnybrook looms in the under-the-hood department. One year ago, it looked like aluminum would quickly take over as an engine block material. Now aluminum is being challenged by lightweight cast iron blocks developed through technical improvements in the foundry trade.

Whether the new cast iron blocks will halt aluminum advances can't be predicted yet. But this competitive situation will bear close watching in the next year or two.

Smaller Engines — The engines themselves are getting smaller in size and, in some cases, horsepower. Another four-cylinder engine will be available in 1962. There will also be some new sixes including a V-shaped one, and there will be a miniature V-8.

Also, cars will continue to shrink in line with the trend set several years ago. New models only a cut above Falcon and Corvair will be brought out by Ford Motor Co. and General Motors Corp. These cars will be closer in dimension to the compacts than to the standard-sized models.

At the same time, some regular models will be reduced in wheelbase and length.

Less Breath and More Buckets— The accent on luxury is a trend that will continue into 1962. Breathtaking interiors and more bucket seats can be expected.

Also, the convertible — considered by many as the epitome of luxury—will be given a big buildup in the coming months. Success of Rambler and Lark in the area of dwarf softtops prompts others to add open-air models to the compact line. This is an extension of the craze over luxury compacts which spread so quickly over the past year.

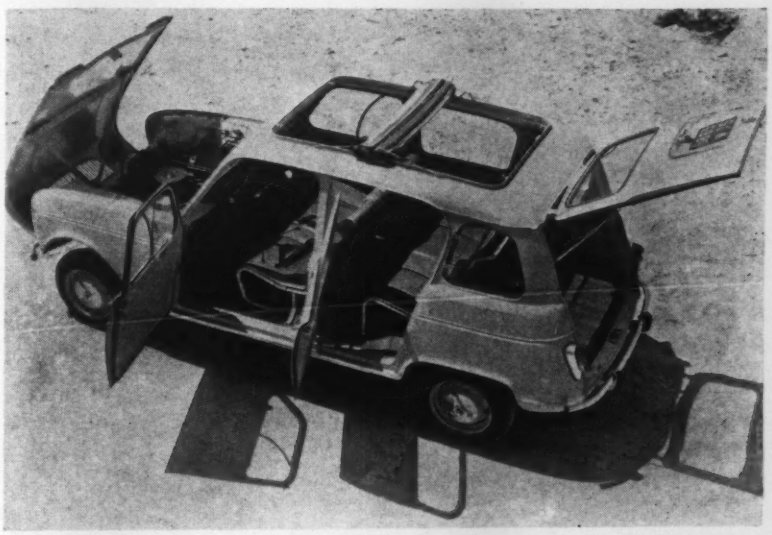
The foreign look will be a big thing as stylists of several American cars strive for the severe, sloping lines of European autos. This means the tailfin—popular for almost six years—faces extinction or near-extinction.

Replacement — Alternators, the little devices that replace generators, will be used on more cars. Every Big Three automaker will offer it on at least some models. GM, for example, will put them on air-conditioned cars as standard equipment.

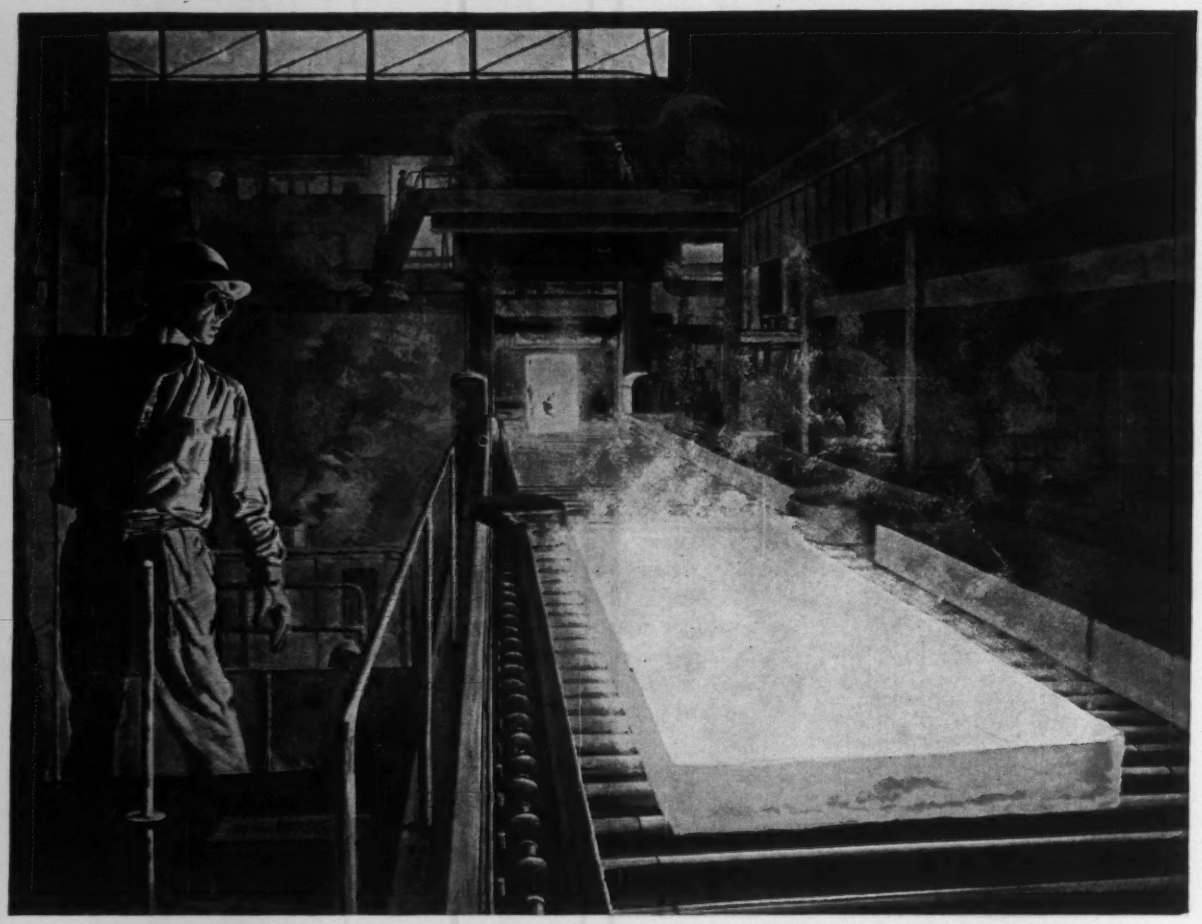
Dual exhausts, already waning in popularity, will disappear on Chryslers and Imperials. But the permanent lubrication phenomenon will be growing. It was introduced in a few models last year; will be a part of more cars this coming year.

Price Question — What about prices? There are several facts to consider. If the automakers come out on the short end of the UAW talks, they would have a fine excuse for jacking up prices. On the other hand, tooling costs for many 1962 models weren't too big. And tooling costs for many of the recently-introduced compacts are now close to being paid off.

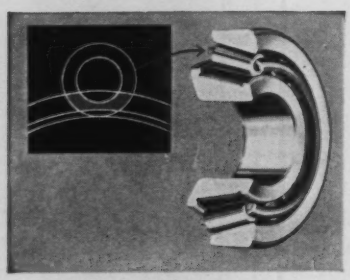
There's No Need for Air Conditioning



WIDE OPEN: The new Renault R4L takes on a spacious look when the rear seat is removed and doors and top opened. Removal of the rear seat provides a 400-lb capacity, 50 cu ft storage area. Sun roof is optional.



Bearings "keep cool" under hot steel!



HIGHER FLANGE IMPROVES ROLLER ALIGNMENT

As shown by the gray area above, the higher flange provides a large two-zone contact area for the roller heads. This greatly reduces wear—practically eliminates "end play". Larger oil groove provides positive lubrication.

Watch it! Coming down the line—another half-formed slab of red-hot steel! And with it comes a supreme test of bearing excellence. Bower Bearings are equal to it—helping to keep this mill operating smoothly and continually despite heavy loads and extreme temperature. Whatever the job, there's a Bower Bearing engineered to perform just as dependably when the going is toughest. Rigid quality controls and basic bearing design refinements like those shown at the left have reduced Bower Bearing failure to a practical minimum. If your product uses bearings, specify Bower! There's a complete line of tapered, straight or journal roller bearings for every field of transportation and industry.

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BOWER ROLLER BEARINGS

Maintenance Costs Can Be Cut

Factory maintenance is not just a chore now. It's a major industry problem.

Executives and engineers looked at recent developments and new trends in this area at a Los Angeles conference.
By R. R. Kay

■ Every executive knows it's costly keeping a plant neat and tidy. But keeping costs down is the big problem.

Factory maintenance has changed from a housekeeping job to a major economic problem. Managers must find new and better ways to keep their houses in order. This is one of the most promising areas to cut costs.

Top Topic — There's a strong trend toward mechanizing all housekeeping functions in the modern factory.

Farwest executives, maintenance engineers, production supervisors, and designers heard much about this at the recent Western Plant Maintenance & Engineering Show and Conference in Los Angeles.

How to increase profits by reducing maintenance overhead was the theme. Latest cost-cutting equipment and service methods were shown. Also displayed: Flooring with special resistance to acids; exhibits emphasizing preventive maintenance, through testing and protecting machines from overload.

New Materials — Featured were new developments in impervious materials for mending, sealing, and insulating factory walls, floors, machinery and storage spaces.

The latest time and labor-saving devices stood out, including: High-speed concrete and masonry saws and drills for installation work; adjustable hydraulic work platforms for maintenance jobs; heavy-duty metal-cutting tools.

High Rewards—The rewards of managed maintenance are great, says R. G. Keizur, maintenance planning superintendent, Trentwood Works, Kaiser Aluminum and Chemical Corp.

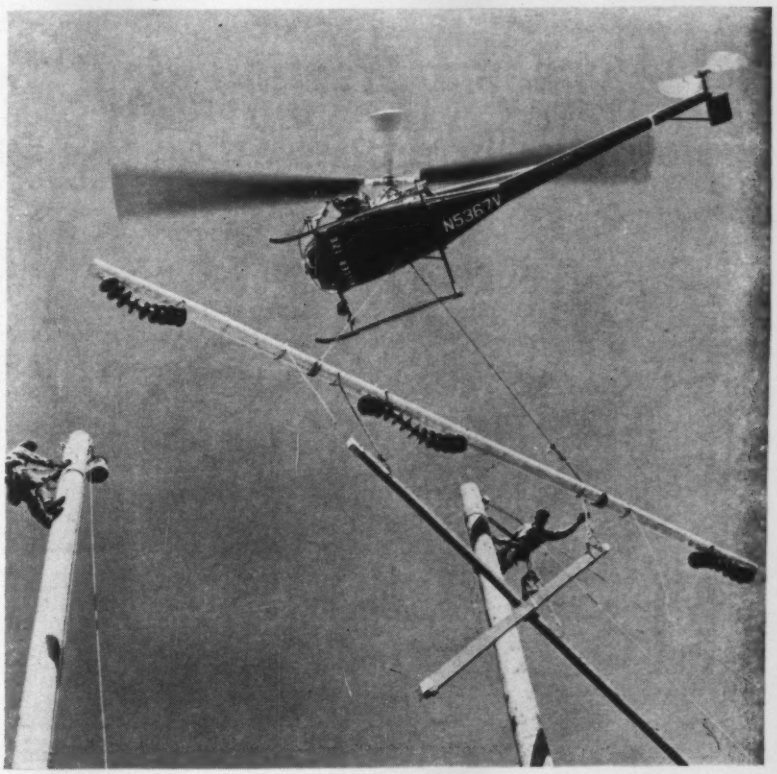
He reports that, in three years, total maintenance expense at Trentwood fell about 50 pct. Downtime was at a record low.

"Downtime on our hot rolling mills is averaging 5 pct or more under three years ago," he says. "These mills are a bottleneck operation. Also, they represent a major part of our maintenance expense."

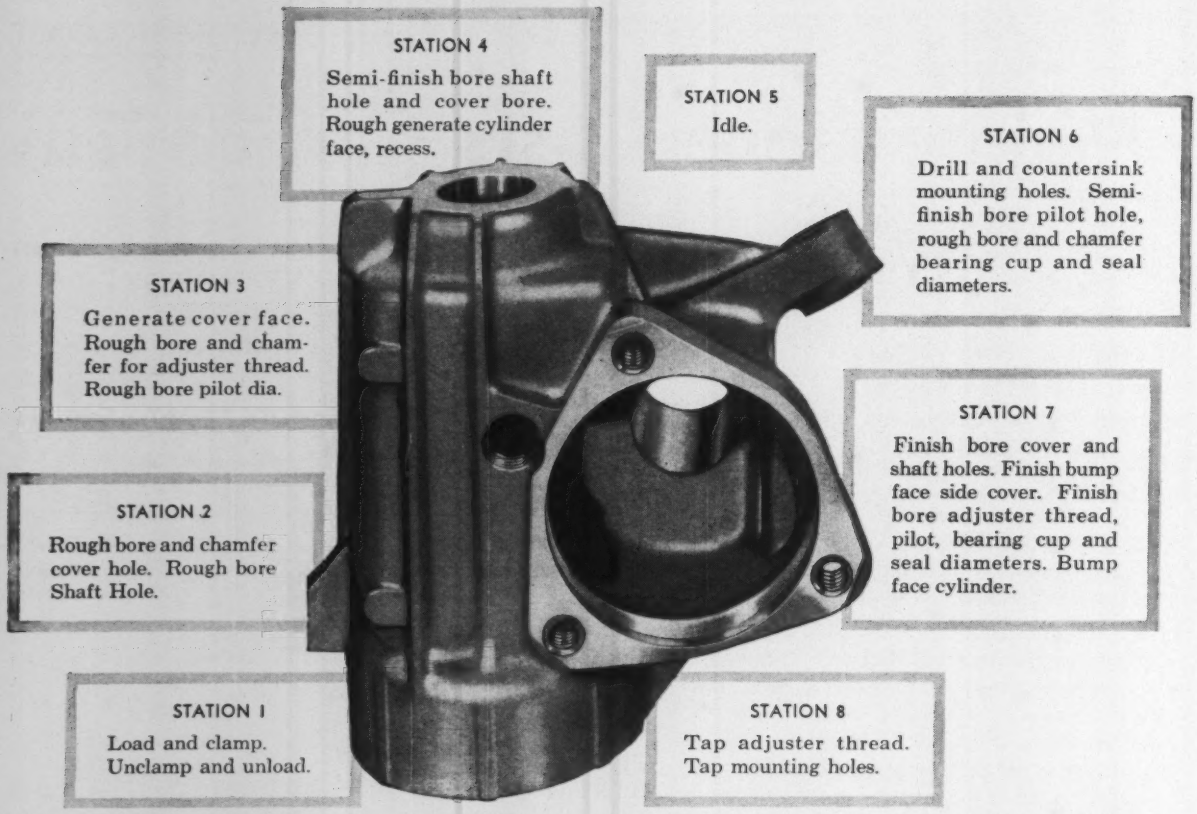
The Results—Here are some results of Kaiser's managed maintenance plan: There's a marked decrease in production promises missed because of machine failure or breakdowns. Rebuild and overhaul schedules are maintained. Construction estimates and time schedules are met with more and more accuracy.

Top management now has new confidence that the maintenance department will hit its quotas.

'Copter Carries Aluminum to the Top

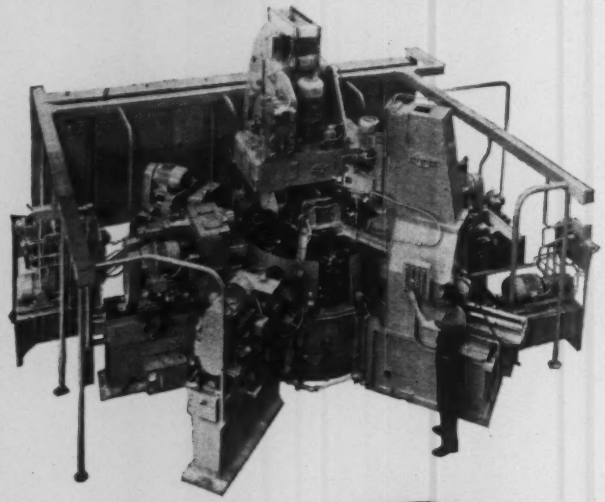


AERIAL UTILITY: Sky hooks swing an aluminum crossarm assembly into place atop electrical transmission structure near Wenatchee, Wash. Use of the lightweight Alcoa crossarms permitted aerial building.


STATION 4
Semi-finish bore shaft hole and cover bore. Rough generate cylinder face, recess.
STATION 5
Idle.
STATION 6
Drill and countersink mounting holes. Semi-finish bore pilot hole, rough bore and chamfer bearing cup and seal diameters.
STATION 3
Generate cover face. Rough bore and chamfer for adjuster thread. Rough bore pilot dia.
STATION 7
Finish bore cover and shaft holes. Finish bump face side cover. Finish bore adjuster thread, pilot, bearing cup and seal diameters. Bump face cylinder.
STATION 2
Rough bore and chamfer cover hole. Rough bore Shaft Hole.
STATION 1
Load and clamp. Unclamp and unload.
STATION 8
Tap adjuster thread. Tap mounting holes.

153 Aluminum Steering Gear Housings per hour

automatically processed on this GREENLEE Machine



This Greenlee 8-Station Horizontal and Vertical Spindle Machine is establishing some excellent performance records for a leading automotive manufacturer. The 52 inch table carries 8 work fixtures. Each has power clamping. To insure rigidity and accuracy, the table is clamped hydraulically metal to metal. Indexing is fully automatic. Cycle time is 23.5 seconds. Like all Greenlee machines it's built for long, continuous service. Can be modified economically if desired. Have our representative give you complete information.

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Foreign Orders Lead the Way Up

June Export Orders More Than Double the May Total

The machine tool industry continues to get surprising support from the export market.

But it also looks for strong domestic support in the last six months of this year.

■ The enormity of the export market for machine tools is continuing to amaze U. S. builders.

June orders for new metal cutting machine tools were a reasonably good $51.4 million net. But the big surprise was the doubling of foreign orders to $20.6 million or about 40 pct of the total. June thus became the best foreign order month in years, only approached by the $18.4 million last December.

New orders for forming tools have gyrated widely this year, June orders continued the pattern. They totaled $9.15 million, compared with $7.9 million in May. Foreign orders rebounded to $3.05 million from $1.1 million in the preceding month, according to the National Machine Tool Builders Assn.

Why They Buy — The foreign volume is, of course, due in large measure to much better deliveries from U. S. builders. Also, foreign users appear willing to make a higher investment for more powerful, highly productive machines. And foreign deliveries being quoted now range from a minimum of about 1 year up to 16 months and 2 years. In the U. S. it's as little as 4 months.

The demand for tools, principally from Europe, is still rather selective. So not all U. S. builders are sharing in it by any means. The hottest European buyers are machinery builders, electrical equipment makers and aircraft engine builders.

East, West and South—The "selectivity arises because U. S. builders are getting the business in proportion to how their machine compares with those made in foreign countries on delivery, price capacity and similar features.

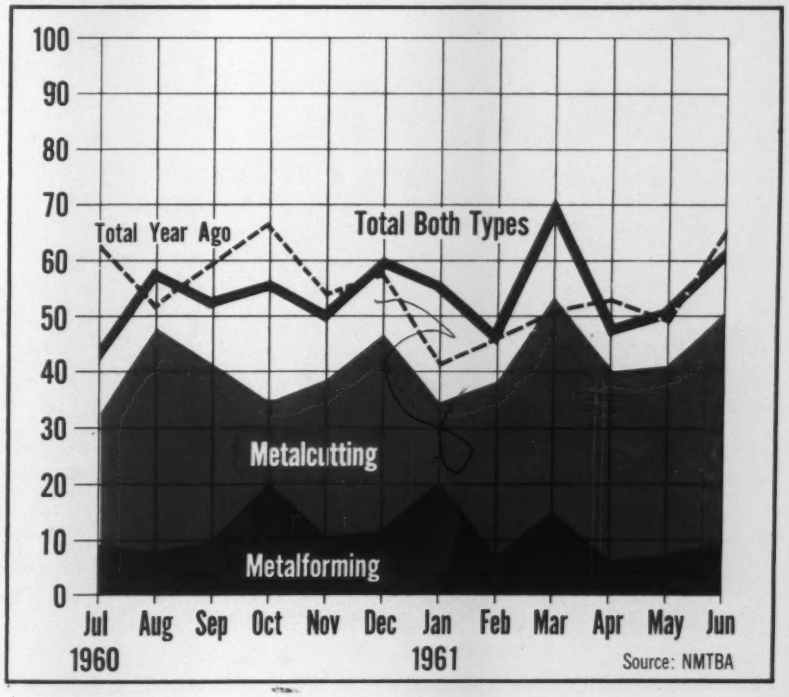
At Warner & Swasey in Cleveland, European orders are coming in well, but more are looked for from Japan and South America.

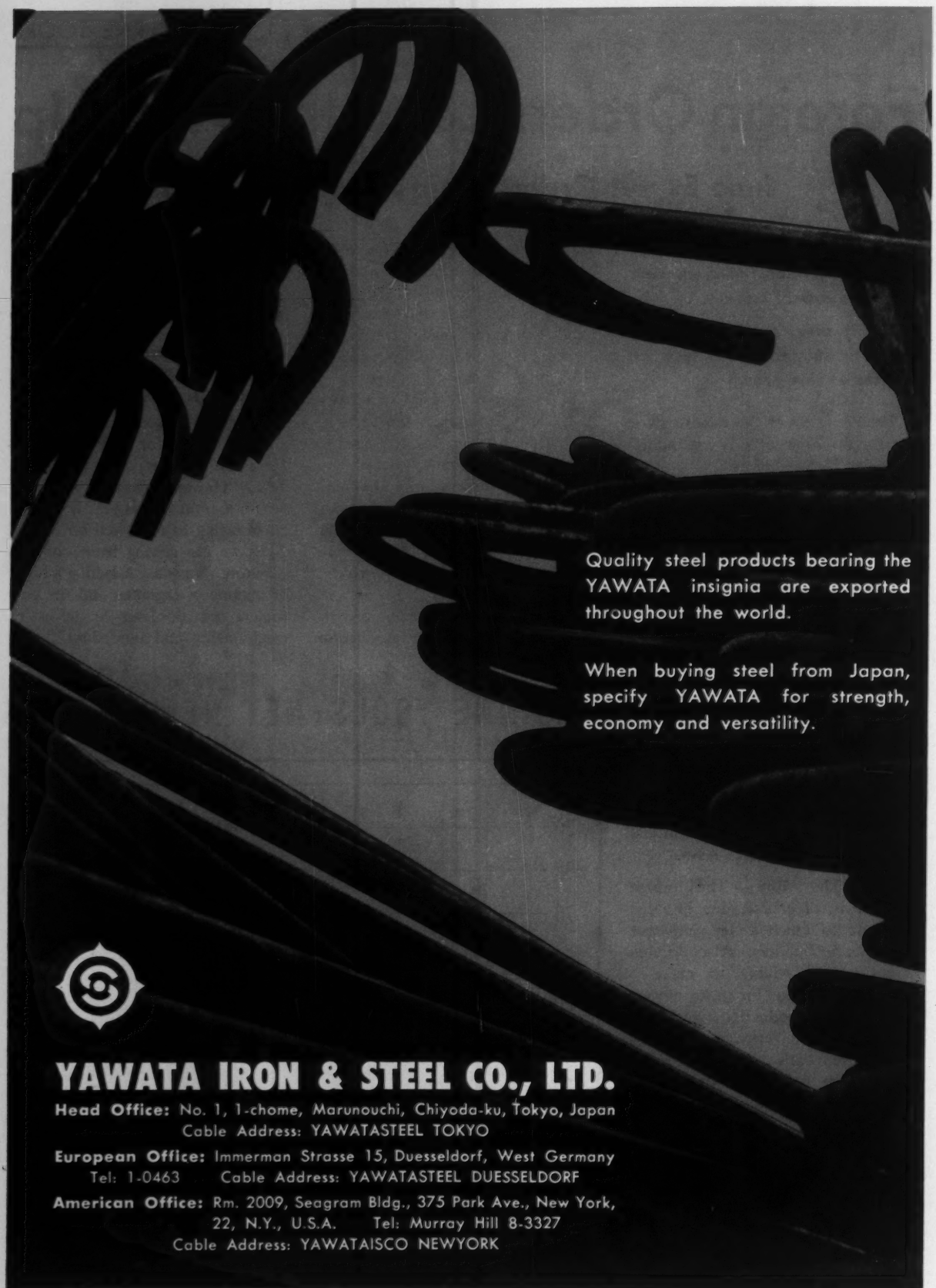
"Our July orders from overseas are running even a little better than June and the order level generally has been fluctuating in rather narrow limits," says Robert Groves, Export Dept.

"Builders of tools for automotive and other special high production types are getting proportionately more foreign orders now than our turret lathes and automatic chucking machines," he points out.

Domestic Revival — At Lees-Bradner Co., Cleveland, the domestic market is showing revival signs.

"Our foreign business is still good and has been for 2 years," says James H. Bradner, sales vice president. "However, here at home the next 6 months of this year look very encouraging to us, based on the reports we are getting from our distributors. They are handling a higher volume of inquiries and the customers are thinking in terms of modernizing and upgrading."

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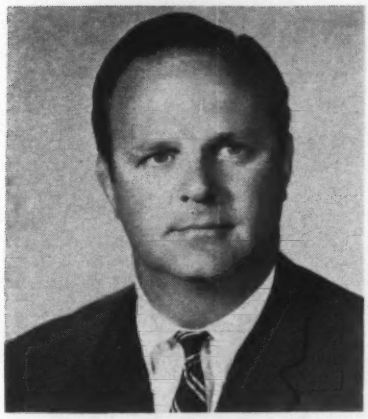
MEN IN METALWORKING



E. M. De Windt, named president, Eaton International, Eaton Manufacturing Co.

Bronze Bearings, Inc. — J. F. Hayes, appointed vice president, sales.

Pittsburgh Plate Glass Co.—F. W. Theis, elected vice president—international; Bjorn Holmstrom, elected president Pittsburgh Plate Glass International; S. A.

Pennsalt Chemicals Corp.—James McWhirter, elected vice president.

Air Reduction Chemical & Carbide Co.—Dr. T. H. Manninen, appointed technical assistant to the president.

LaPointe Machine Tool Co.—J. P. Crosby, appointed vice president-director sales; J. W. Dopp, appointed vice president-sales.

Midwest Steel Corp.—H. S. Bishop, appointed manager, Railway Trackwork Manufacturing Div.

Hill-Chase Steel Co.—J. D. Reid, appointed manager, aluminum sales.

Chrysler Corp.—Dr. G. S. Bennett, appointed chief scientist—acoustics, Missile Div.

Dresser Industries, Inc. — J. V. Holdam, elected vice president.

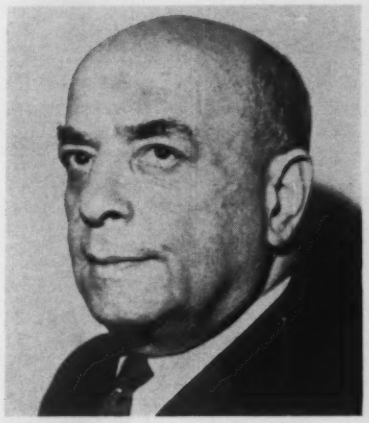
Republic Steel Corp. — R. N. Wells, named Boston branch manager, Berger Div., sales; W. L. Myers and G. E. Stults, named assistant sales managers, Detroit.

Kaiser Aluminum & Chemical Corp.—R. F. Buechner, appointed manager, integrated primary aluminum and fabricating works at Ravenswood, W. Va.; J. H. Williams, appointed manager, Trentwood, Wash., rolling mill.

Carpenter Steel Co.—R. C. Meili, named assistant manager, stainless steel sales.

Nu-Era Corp.—J. W. Dinley, appointed vice president, marketing.

Nelsen Steel & Wire Co.—G. J. Kilcullen, named director, manufacturing.



Jack Kaye, elected vice president, Luria International Div., Luria Bros. & Co.

Corning Fibre Box Corp.—J. D. Liptak, appointed controller.

Monroe Calculating Machine Co.—Andrew Anderson, appointed vice president, manufacturing.

P. R. Malloy & Co., Inc.—J. E. Templeton, appointed director, western operations.

Parker-Hannifin Corp. — A. W. Lindstrom, named vice president, International Div.; J. P. Mockler, appointed New England regional manager.

(Continued on P. 60)

W. J. Pinkerton, elected president and general manager, Micromatic Hone Corp.

R. W. Gauss, elected executive vice president and treasurer, Micromatic Hone Corp.

J. J. Offutt, elected executive vice president, A. P. Green Fire Brick Co.

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RELIABLE CHAIN DRIVES FOR ALL INDUSTRIES

ROLLER CHAINS, SPROCKETS, CONVEYOR CHAINS, FLEXIBLE COUPLINGS, ATTACHMENTS. (Special and Standard)

(Continued from P. 59)

North American Aviation, Inc.—W. F. Snelling, appointed executive vice president; Gary Stroh, appointed manufacturing vice president, Los Angeles Div.

Security Valve Co.—Robert Linquist, appointed vice president, engineering.

Elliott Co.—F. M. Fives, appointed vice president and general sales manager.

Elox Corp. of Michigan—C. P. Porterfield, named director, sales.

Golden-Anderson Valve Specialty Co.—J. H. Kilmer, Jr., elected president and general manager.

American Brake Shoe Co.—R. A. Frick and V. L. Persbacker, elected vice presidents.

Babcock & Wilcox Co.—S. M. Snyder, named Pittsburgh district sales manager; J. W. Thompson, named district sales manager, Charlotte, N. C.; J. E. Roberson, named sales engineer, Boiler Div., Cincinnati.

American Chain & Cable Co., Inc.—T. P. Bronco, appointed New York district sales manager, Page Steel & Wire Div.

Ajax Magnethermic Corp.—H. F. Gauker, named assistant division manager; J. R. Coley, named sales manager, Trenton Div.

Alan Wood Steel Co.—Malcolm Martin, named superintendent, coke and chemicals dept.

Dravo Corp.—H. G. Solbach, Jr., appointed superintendent, grating manufacture; J. S. Murray, Jr., appointed production engineer, light metals dept., Engineering Works Div.

General Dynamics/Electronics—Dr. E. G. Brock, appointed manager, Quantum Physics Laboratory; Dr. C. E. Drumheller, appointed manager, Physical Electronics Laboratory; Dr. G. W. Sears, appointed manager, Molecular Physics Laboratory; Dr. Hisao Yamada, appointed manager, Information Processes Laboratory, Research Div.

F. P. Kelly, named vice president, manufacturing, Taylor Fibre Co.

R. R. Hydeman, named vice president, marketing and engineering, Taylor Fibre Co.

Epps Industries, Inc.—J. H. Feig, appointed treasurer.

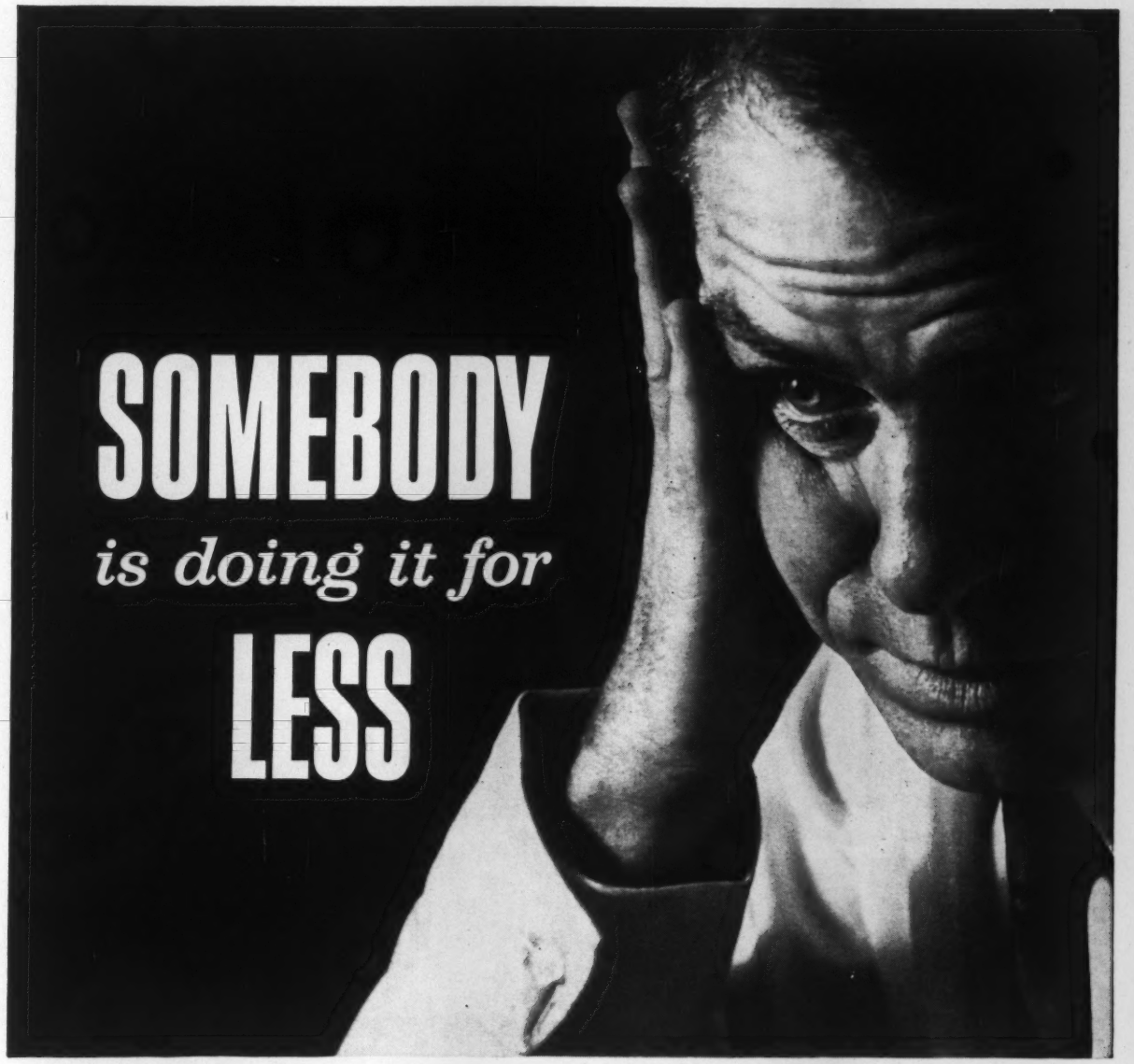
Rockwell-Standard Corp.—C. C. Warne, Jr., appointed sales assistant to the vice president, Industrial Products Group.

Leece-Neville Co.—H. J. Zuske, appointed vice president and general manager, Fractional Horsepower Motor Div.; A. D. Gilchrist, named vice president and general manager, Alternator and Standard Products Div.; R. G. Hill, named general sales manager; W. E. Carter, named sales manager, original equipment.

U. S. Industries, Inc. — T. O. Thomas, appointed general manager, International Div.

American Hoist & Derrick Co.—R. L. Wicker, appointed manager, distributor sales.

(Continued on P. 63)



MASTERLINE® 51B SUPERFINISHER

New—for parts not requiring traverse. Longitudinally adjustable platen supports reciprocating unit holding one or two quills. Add a second platen and you can handle up to four diameters at once—automatically.

Model 52A, which is similar, offers longitudinal stone traverse. Call your Gisholt Representative or write for Catalog 1215.

Are you giving your competitors a price edge by not using Superfinishing?

This modern process enables you to control surface finish from 1 micro-inch RMS to 80—piece after piece—*automatically*. Whether you Superfinish® after grinding or direct from turned surfaces, you will improve quality, metallurgy and geometry. And in either case you save time and money.

Whether you finish cylindrical, tapered, flat or spherical surfaces, Superfinish enables you to do a better job at less cost.

GISHOLT
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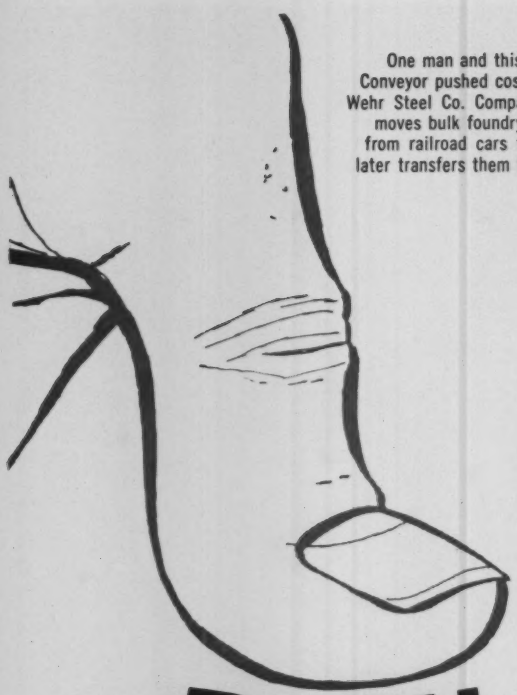
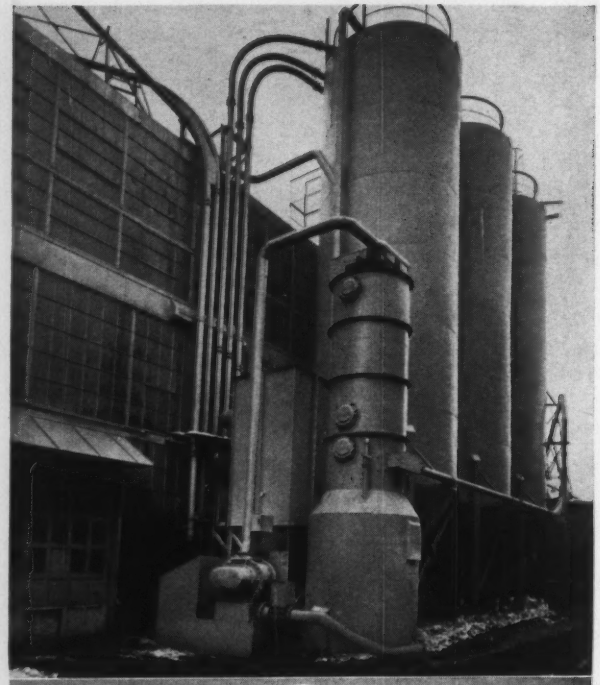
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee



One man and this Airstream Conveyor pushed costs down at Wehr Steel Co. Compact system moves bulk foundry materials from railroad cars to storage, later transfers them to process.



PUSH COSTS DOWN.... move up to modern handling

look how these

foundries cut costs with Dracco Airstream Conveyors

Major automotive foundry saves $32,000 a year in labor costs! Airstream Conveyor unloads core binders 400% faster than manual methods, moves them at 20 tph to eight storage bins without intermixing.

Wehr Steel Co., Milwaukee, realized multiple cost savings with its Dracco Airstream Conveyor. Bulk buying cut bentonite costs over $12,000 a year, reduced sand and other material costs $3-$5 a ton. Bulk handling slashed labor costs 50%.

Large aluminum foundry by-passes costly handling by air conveying sand from railroad cars to 100-ton silo at 10 tph. Labor required: one man. Cost of bags: eliminated. And there is no dust, waste, safety hazards or expensive maintenance.

Kelsey-Hayes Co., Detroit, air conveys seacoal and bentonite to mulling stations. One man with a push button-controlled Airstream system pushes costs down here, assures 100% material usage with no dust or waste.

Modernized bulk handling with Dracco Airstream Conveyors introduces improved productivity at lower cost. Savings result from bulk buying, less labor, faster handling, cleanliness, safety and simplified maintenance. Why not include a Dracco Airstream Conveyor in your cost reduction program?

For expert assistance when you move up to modern handling, contact: Dracco Division of Fuller Co., Harvard Avenue and East 116th Street, Cleveland 5, Ohio.

Write today for further information. Ask for 32-page Bul. 530, "Dracco Airstream Conveyors".

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY GENERAL

(Continued from P. 60)

Michigan Wire Cloth Co.—Myles Bradley, named vice president, operations.

George K. Garrett Co., Inc.—F. J. Borowsky, elected president; J. D. Clark, named vice president and secretary.

Brooks & Perkins, Inc.—A. X. Schmaltz, appointed controller.

Page Communications Engineers, Inc.—G. E. Boggs, appointed director, research and development.

Griffin Wheel Co.—Frank Marold, appointed vice president and assistant general manager; W. R. Colton, appointed sales manager.

Perkin-Elmer Corp.—H. F. Brookschmidt and R. H. Sorenson, appointed vice presidents, Operating Div.

General Motors Corp. — H. H. Kehrl, appointed manager, quality control, Chevrolet Motor Div.

General Electric Co.—W. L. Batty, Jr., named western district manager, Silicone Products Dept.

Mallory Metallurgical Co.—J. L. Wilkes, appointed general sales manager.

United Aircraft Products, Inc.—H. L. Benjamin, named vice president, marketing and engineering.

Motorola, Inc.—Kenneth Ruby, appointed chief mechanical engineer, western center, Military Electronics Div.

Special Metals, Inc.—Dr. F. N. Darmara, elected president; Dr. I. S. Servi, J. S. Huntington and H. J. Hamjian elected vice presidents.

National Research Corp. — Dr. M. L. Torti, named director of metallurgical research, Metals Div.

King-Seeley Thermos Co.—B. O. Hermanson, appointed purchasing agent, Queen Products Div.

Consolidated Electrodynamics Corp.—C. A. Mounteer, named asst. general manager, Transducer Div.

E. W. Bliss Co.—Arthur Lind, appointed project engineer, Rolling Mill Div.

Chicago Bridge & Iron Co.—G. O. Penna, appointed director, sales promotion, South American operations.

Lewis Steel & Aluminum Co., Inc.—James McGaw, Jr., appointed assistant sales manager.

Willys Motors, Inc.—A. C. Sampietro, named chief engineer.

Molded Fiber Glass Companies—H. L. Andrews, appointed manager of market research.

Olin Mathieson Chemical Corp.—J. R. Higgins, appointed purchasing manager—metals.

Allis - Chalmers Manufacturing Co.—W. A. Johnston, elected to the board; J. W. Snarr, appointed manager of processing industry sales, Chicago district, Industries Group; J. H. Jones, appointed manager, El Paso district.

Youngstown Sheet & Tube Co.—E. E. Lynn, elected assistant secretary.

SKF Industries, Inc.—F. J. Bednarczyk, appointed chief quality engineer.

Plasteel Products Corp. — Lee Levy and D. R. McGowan, appointed sales engineers, New York.

North American Aviation, Inc.—W. F. Parker, appointed vice president, program management, Space & Information Systems Div.

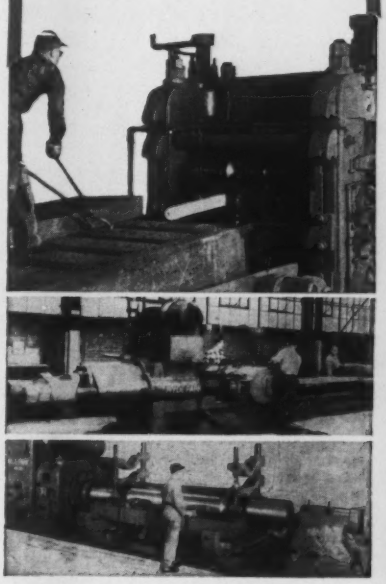
National Valve & Manufacturing Co.—M. W. Eddins, named chief welding engineer.

DuBois Chemicals, Inc.—E. C. Korte, appointed chief chemist East Rutherford, N. J. plant; J. T. Salter, appointed production manager, all manufacturing facilities; S. H. Palmer, appointed manager, Dallas plant.

OBITUARY

R. K. Turner, 59, vice president, Union Carbide Corp.

Hyde Park
ROLLING MILL EQUIPMENT



Hyde Park Engineers are always ready to co-operate with you in selecting and applying the rolling mill equipment best suited to your operation.

Bar Mills • Merchant Mills
Sheet and Strip Mills
Stretcher Levellers
Roller Tables • Pinion Stands
Sheet Mill Shears
Roll Lathes • Reduction Drives
Special Machinery • Machine Work

Hyde Park
FOUNDRY AND MACHINE CO.
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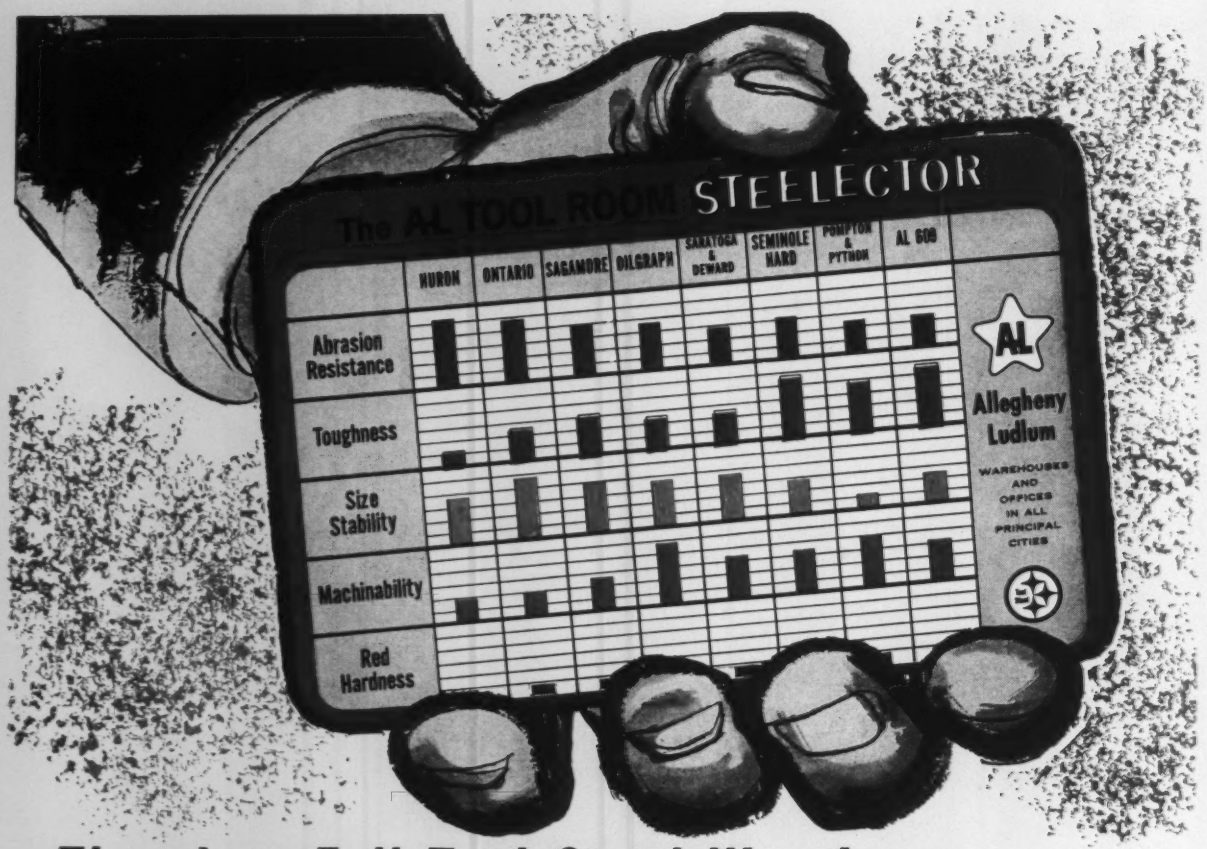
Rolls
Rolling Mill Equipment
Gray Iron Castings



There's a Full Tool Steel Warehouse
Behind the A-L STEELECTOR Cards!

The pocket-size STEELECTOR Cards represent a full tool steel warehouse—full of the grades and shapes and sizes.

Each STEELECTOR Card (there are cards for hot work, high speed, and tool room applications) uses bar graphs to show how the STEELECTOR grades compare in abrasion resistance, toughness, size stability, machinability, and red hardness. In a glance you can select the grade with the best combination of properties for virtually any job.

And when you select a STEELECTOR steel, you know beforehand that it is quickly available. Warehouse supplies have been increased because of the widespread usefulness of STEELECTOR grades.

A Data Stock List for each STEELECTOR grade gives you additional information—to help you make sure that the steel fits your job exactly. The steel's properties are described and the proper hardening, tempering, and annealing temperatures are given along with the steel's analysis and AISI number. A list of typical applications together with suggested working hardnesses serves as an additional check on your use of the steel.

The Data Stock List also tells exactly what sizes and shapes are in warehouse stock. You know before you order that the tool steel you choose is ready for prompt delivery.

By using STEELECTOR grades, you can save storage space in your own plant. You can reduce the number of grades you stock. And you can rely on fast off-the-shelf delivery in case your own stock runs low.

For more information on the STEELECTOR system, ask your Allegheny Ludlum representative for your copy of the colorful, 10-page STEELECTOR Booklet, or write: ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.*** Address Dept. A-8. 3240

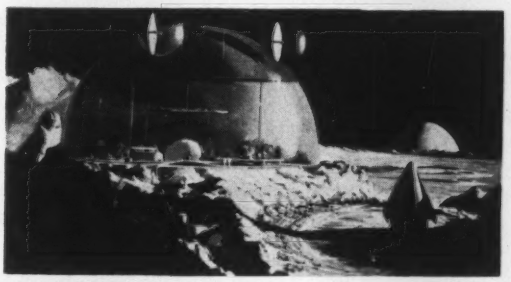
STEELECTOR PROGRAM

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country

Sheds Light on Lunar Base

Man's first lunar base may be in such mountainous polar regions as the "Mountains of Eternal Light". Scientists say the site would provide continuous sunlight for solar power and to grow



LUNAR BASE: Slated for mountainous region.

plants for food and oxygen. An inflatable plastic dome would house the base. A typical temperture forecast on the moon would be thus: High for today 212°F with an expected low of –240°F.

NASA Launches Ranger

A sharp acceleration of the nation's space program, including unmanned exploration of the moon, is underway. NASA began spending the $1.8 billion just authorized by Congress. This week NASA got its lunar space program off the ground with test flights of the Ranger, the new craft designed to explore 500,000 miles deep into space.

Suspends Columbium Ball

A little ball of columbium, fabricated to roundness tolerances of 0.000010 in., will play a vital role in a super-precise guidance system for future space travel. It'll be the heart of a gyroscope. Suspending the ball in a magnetic field, free of all causes of friction, will give the extreme accuracy. Once set in motion, the columbium sphere should spin freely for years.

Computer Checks Alertness

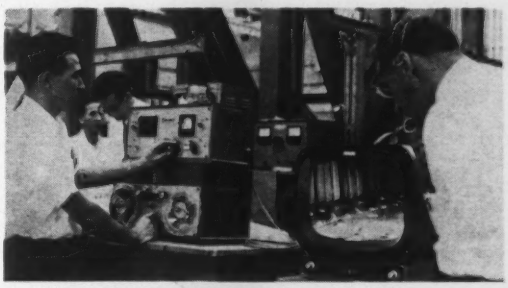
Computers can be invaluable tools in determining critical fatigue levels and alertness of astronauts, airmen and motorists. So says RCA's Dr. D. S. Himmelman. The applicant for a driver's license, for example, would be tested behind the wheel of a mock-up auto, with a motion picture of varying highway conditions replacing the customary windshield. Signals from the subject's brain would be fed to the computer for comparison with predetermined standards.

Kennedy Gives Green Light

The FCC is prodding private industry to get started on a space-satellite communications program. The prodding followed President Kennedy's endorsement of private ownership and operation. Industry was asked to form a committee and work out a plan for joint development. While the President supports private ownership, the government will be firmly in control of the policy under which systems will run.

B-70 Takes Torture Test

Engineers working on the 2000-mph B-70 airplane at North American Aviation, Inc., use closed-circuit television for torture testing the aircraft's structural sections. The TV hookup provides a closeup view at a safe distance while

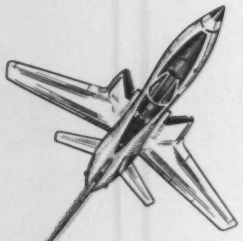


TORTURE TEST: At a safe distance.

heavy forces are being applied to the B-70 sections. Observations are taped for playback at later briefing sessions.

Jet Copies Hummingbird

Researchers at Lockheed Aircraft Corp. are building a turbo-powered plane for the Army that will fly like a hummingbird. It would fly straight up and down, hover in mid-air and dart forward at jet speed. Heart of the aircraft is a system of ejector-mixing chambers buried in the fuselage. High velocity exhaust diverted from two jet engines feeds the chambers. By angling the chambers, flight direction changes.



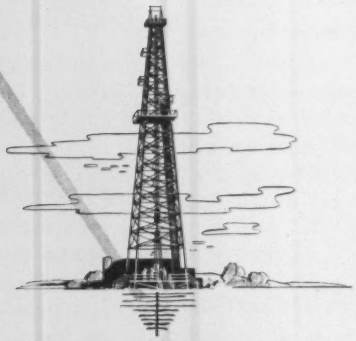
50,000 FEET UP

V-R Carbides are used to machine the aircraft metals that withstand twice the speed of sound. Cutting tool inserts, made of V-R Carbide, are doing an outstanding job on tape controlled milling machines producing superalloy components for Republic's all-weather, Mach 2, F-105 Thunderchief — the world's most powerful one-man airplane.

V-R FIRST CHOICE of more and more industries

V-R Carbides are used to resist wear deep in the earth where oil well drilling is the toughest. Mud nozzles, made of superior abrasion-resistant V-R Carbide, are hard at work — increasing drill bit life, reducing down-time and speeding progress.

25,000 FEET DOWN



CREATING THE METALS THAT SHAPE THE FUTURE

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C-840

How to Take the Guesswork Out of Project Planning

By **B. M. Christensen**—Senior Operations Analyst, General Electric Computer Dept., Phoenix, Ariz.

Management's decisions can spell the difference between profit and loss on a project.

Too often, guesswork is used in making such vital decisions. Programming offers a challenge to these hit-or-miss efforts.

▪ Precise project planning is one of the prime functions of top management. If a company makes a wide range of products, foolproof project-planning methods must be used.

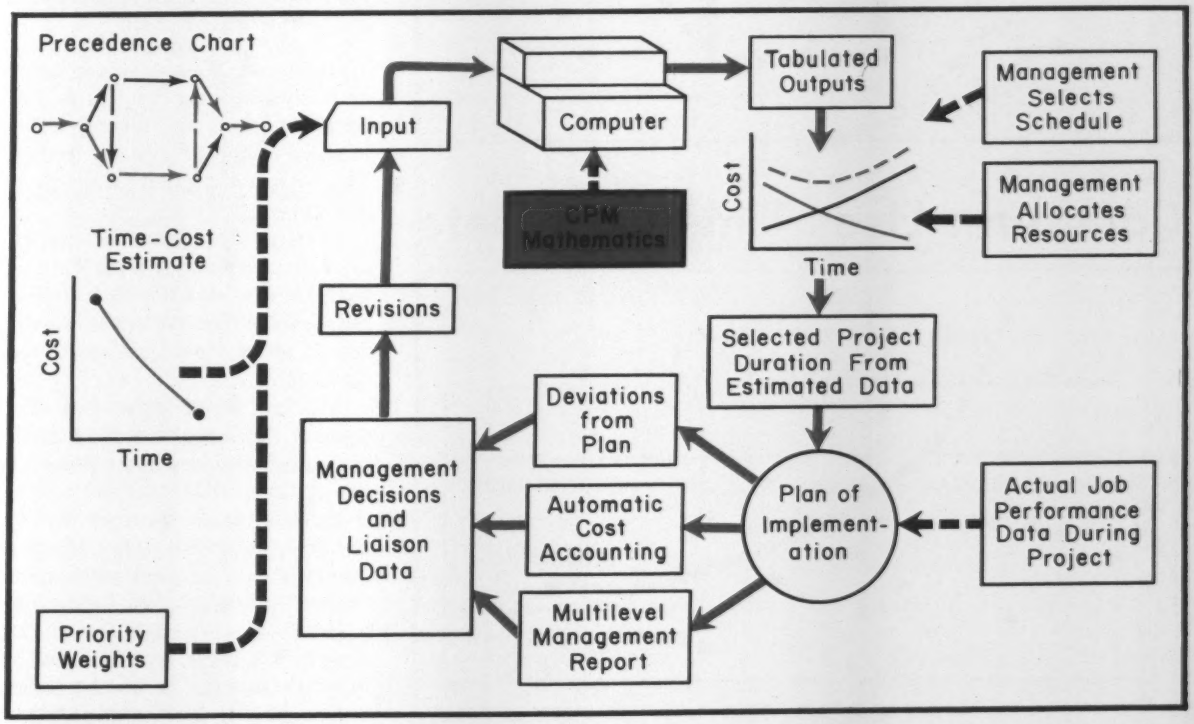
Management has to derive factual, objective data in initial-planning stages. But in setting up a plan of implementation, you also have to allow leeway for deviations. All planning techniques must insure proper use of both time and money.

Cuts Corners—One proven technique is the critical path method (CPM), developed by Mauchly Associates, Ambler, Pa. Full benefits of CPM hinge on easy access to a properly-instructed electronic computer.

CPM pinpoints critical jobs while blocking bottlenecks before they occur. Thus it eliminates costly and unnecessary delays. In essence, CPM begins with a pictorial line sketch of the entire project. This simple arrow diagram shows the relationship and the sequence of all work involved in a project.

General Electric's new GE 225 information processing system uses the arrow diagram as part of its "software" package. CPM enters the management cycle as an integral

Closed Loop Maintains Complete Control



PROGRAMMED PROJECT: Simple elements are used to form a complete picture of a complex project.

part of a man-computer team.

Educated Analyses—This team reduces guesswork in decision making. In initial-planning stages, the same CPM data provide more powerful results than were heretofore possible.

During implementation stages, the man-computer team again uses CPM mathematics. As a direct result, the integrated team maintains close control of all stages of project implementation.

CPM facts are based on three pieces of input data. The first centers on the precedence relationship between activities, operations or other work stages which are carried out in kicking off a project.

Orderly Flow—An arrow represents each activity. These arrows connect to form a diagram which accurately depicts the sequential relationship between all activities. The second chart shows a simple color-coded precedence diagram. A more typical, complex diagram appears as the last illustration.

The length and direction of an activity arrow is immaterial. Time flows from each arrow's tail to its head. In the second diagram, activities B and C can't be started until activity A is wrapped up. Likewise, activities B and D are both prerequisites for starting work on activity E.

Let's associate time with each activity in the project. One sequence of arrows—from the start position to the project's end—dictates overall working time. Sometimes more than one sequence fix the duration of a project.

Critical Path—Activities in the time-dictating path are called critical activities. Their sequence forms a critical path. The activity durations along this path add up to the overall project time.

All of the other activities, those not on the critical path, have a certain amount of leeway or float.

Now, we'll check out a second piece of CPM input data. This second set of information takes the form of a time-cost relationship for each of the project's activities. An example of this relationship appears in the third chart.

When an activity is performed on a normal basis it requires a certain amount of time and expense. This is indicated by the normal point on the third chart.

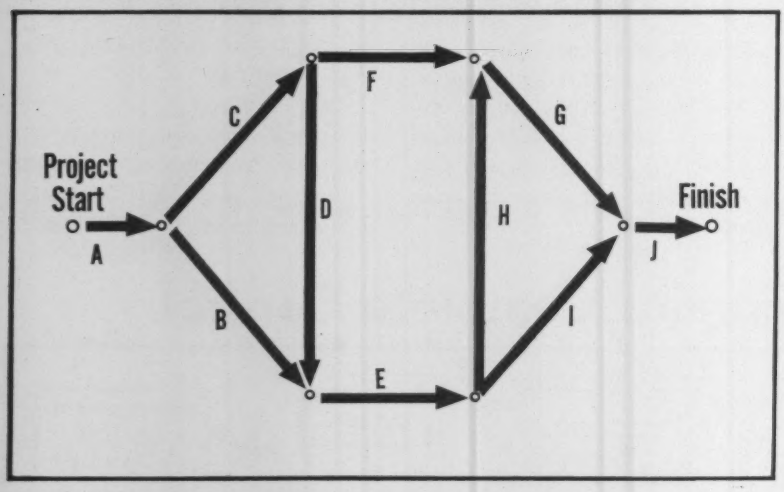
Haste and Waste—If the activity is expedited, the cost spirals. Expenses build up until it's impossible to speed up the activity any further. This is the crash point on the time-cost curve.

In most cases, you can approximate data by drawing a straight line from the normal point to the crash point. These time-costs data are the second set of input facts fed to the computer.

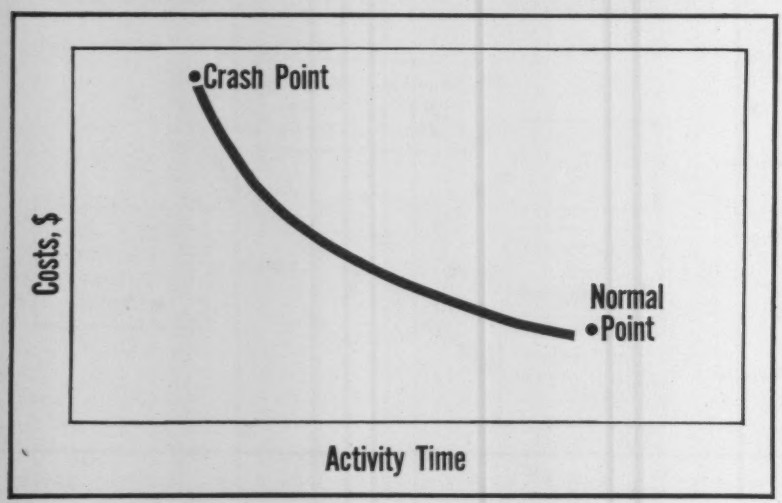
The last set of input data centers on the float or leeway that's associated with any activity not on the critical path. Sometimes an activity's time estimate proves hard to fix. In such a case, any available leeway should be used without affecting the critical path's duration.

Here's how the GE 225 CPM program handles priority - weight (leeway) factors. A number from one to nine is used with each activity. The higher the number, the

Critical Path Dictates Time



Computer Uses Time-Cost Data



greater the amount of float or leeway associated with the activity.

Data Processing — All three pieces of input data feed into the computer. At this point, the CPM software package enters the picture.

A mathematical formulation of alternate-schedule solutions is the main feature of the CPM package. Each alternate schedule identifies all project phases in terms of time and cost.

The computer yields a series of tabulated schedules. For successively shorter project durations, each schedule shows the least costly way of implementing the project.

Graphically, the project's direct costs and time periods can be depicted quite easily. The fourth chart serves as an example. You'll note its position in the closed loop on the first illustration.

Select Schedule—Before management decides which of the schedules it wishes to use, overhead and other indirect costs must be added to the project's direct costs. This pinpoints the total cost of implementation.

After the project is started, actual job-performance data may be gathered. Normally, performance data are collected at fixed intervals. Then these data are compared to the plan of implementation.

In most cases, the performance data correspond to the selected activity characteristics. If exceptions crop up, a report is passed "up the line."

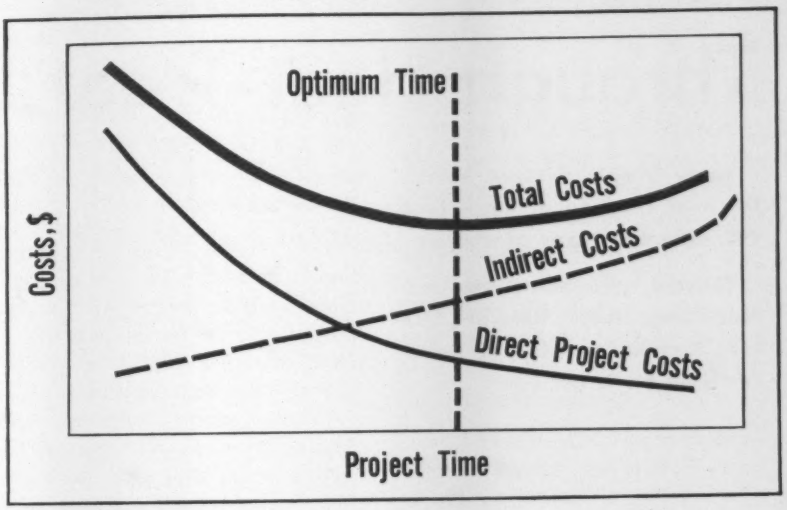
Complete Control — Throughout the life of the project, true management by exception remains a reality. When deviations from the plan are reported, revisions are decided upon. All affected activities are corrected on the input cards.

In this dynamic - management cycle, decision-making guesswork is a thing of the past. Management has at its fingertips a set of guaranteed minimum-cost alternatives. Thus, there's no hit-or-miss efforts used in selecting or altering a project plan.

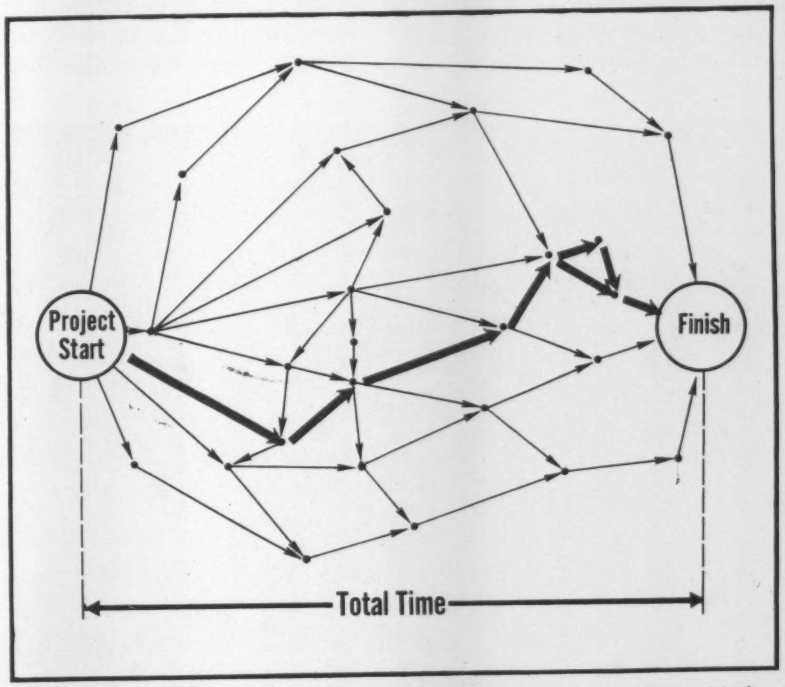
To survive in a competitive market, a company has to make a profit. Optimum utilization of a company's two most precious resources—time and money—guarantee good results.

With CPM and a properly-instructed computer, you obtain stimulative thinking.

Check Project's Total Costs



Arrows Represent Activities



COLOR CODED: Precedence diagram shows the sequential relationship between all activities. Time flows from each arrow's tail to its head.

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Simple Fixtures Swing Parts Through Heat-Treat Lines

Three simple fixtures handle the heat treating of more than 700 different types of shapes.

Teamed with automatic austempering, these fixtures turn out 14-million pounds of wear-resistant parts per year.

▪ Modern agriculture requires exact intervals between plowed furrows. This spacing, in turn, hinges on accurately shaped tools that won't warp or bend out of shape.

These tools must be hard enough to resist abrasion while retaining good cutting edges. In addition, they have to be ductile. Lack of ductility causes brittle failures when the tools hit obstructions.

Cost Factor—Price is another important factor. The cost of high-alloy steels is prohibitive. On the other hand, the use of heat-treated steels with too low an alloy content reduces wear resistance.

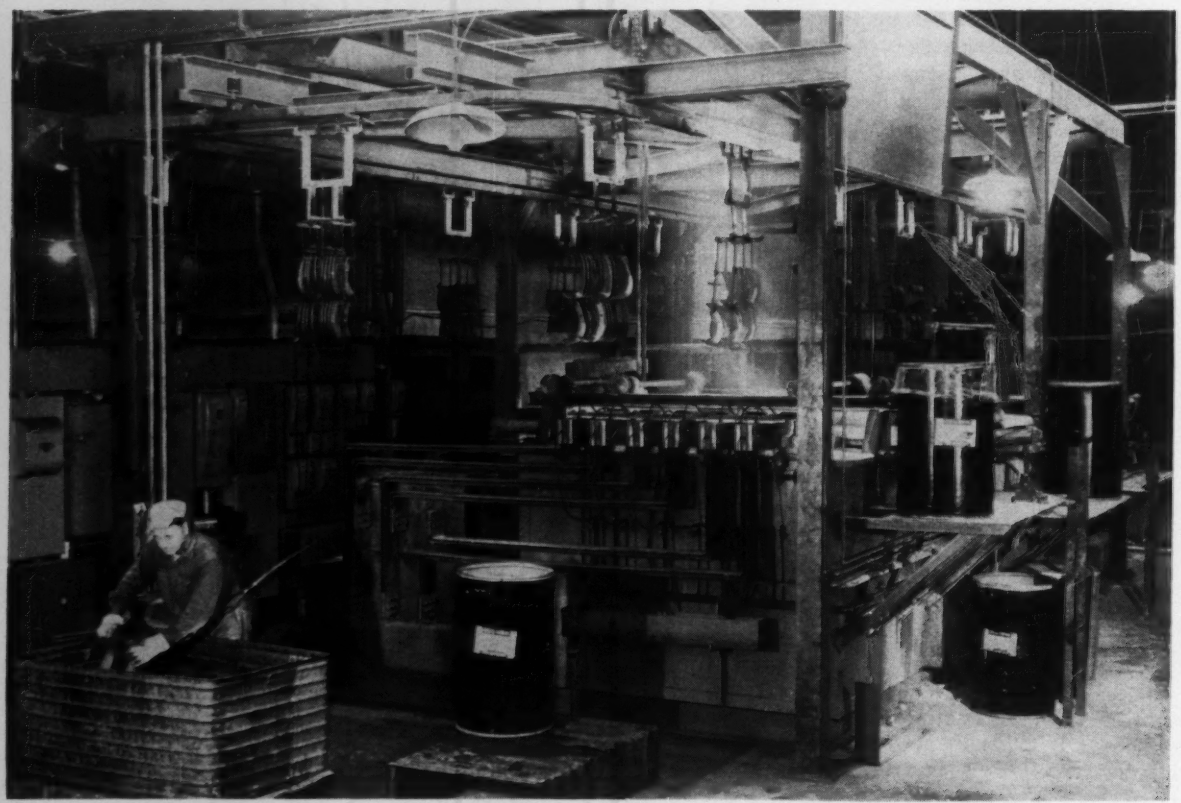
With years of experience, the Empire Plow Co., Cleveland, has settled on C1080 steel for most farm tools. A company spokesman states: "This material, heat-treated isothermally, combines toughness, ductility and economy."

Empire Plow uses two fully-mechanized salt-bath lines to heat treat 7000 tons of tillage parts per year. The hardness of these heat-treated parts is held to a consistent 42 Rc.

Ductility problems are also under control. Empire's engineers devised a fast low-cost ductility-test setup. It consists of a V-shaped die and a mating rod. A standard brake exerts platen pressures.

Old and New—Both of the salt-bath lines were built by the Ajax Electric Co., Philadelphia. In the last 12 years, the original austempering line has heat treated almost 40,000 tons of parts.

Now, let's check out the compact new installation. This new line occupies only 18 x 40 ft of floor-



COMPACT LINE: Taking up only 18 x 40 ft of floor space, an automatic austempering line heat treats 1100 lb of farm-equipment parts per hour. This new line operates 24 hours per day on a seven-day-a-week basis.

space. One operator handles the entire line. All he has to do is load and unload the parts.

An elevator-type device indexes the parts through the line. It conveys each part through a salt-bath furnace for austempering. Then it lowers each batch of parts into a quenching dip, a salt-bath draw, and wash and hot-rinse tanks.

Room to Grow — There are a couple of empty stations in the new line. They've been left open for possible future-processing needs. Thus, phosphatizing or other operations can be added to the existing line.

The entire heat-treat cycle is completely automatic. At preset intervals, the elevating device lowers and raises the loads in and out of the various baths.

There are twenty hangers in the line. Each one handles a 52-lb work load. Total hourly output is about 1100 lb.

Starting with flat bars and plates, the company cold forms many basic shapes. Later, these shapes are hot worked to final dimensions.

Heat and Finish—Gas-fired furnaces heat the basic shapes to 1800°F. This reduces the possibility of stresses in final-shaping stages. It also prolongs the life of the forging, coining, punching, pressing and stamping equipment.

All grinding work is done prior to heat treating, while the work is still soft. No grinding or machining is needed after the parts pass through the austempering lines.

Originally, the company used dozens of different fixtures to carry the multifarious shapes and sizes through the heat-treat cycle. Now, three simple fixtures handle more than 700 types of parts.

For maximum service life in this heavy-duty operation, these fixtures are made of Inconel. Due to the fixtures' simplicity, very little set-up time is needed to switch from one part shape to another.

Scale Free—As the parts index through the line, they're heated to 1580°-1600°F. Exact temperatures hinge on the work in process. The quenching dip is held at a constant 400°F. Also remaining constant is the salt-bath draw at 750°F.

Emerging from the final wash and hot rinse, the parts are completely clean and scale free. As they leave the line, they're ready for painting and packing.

Empire Plow Co. makes all of its own cultivating-equipment accessories. Part sizes range from a few ounces to 25-lb winged cultivator sweeps. Other products include: Blades, teeth, spikes, furrowers and similar earth-contacting parts. The company also does a sizeable business in rotary-mower blades.

EASY TO LOAD: Operator loads up to 52 lb of shaped farm tools on each of the fixtures.

NO DIRT: As the washed and rinsed parts leave the heat-treat line, they're ready for shipment.

Breakthrough in Nuclear Fuel Unshackles Reactor Design

Matter's core imprisons unlimited power. But we pay too dearly for this nuclear energy.

Expensive radiation shields frustrate our attempts to produce low-cost atomic power.

▪ Lethal radiation is the big stumbling block for nuclear-reactor designers. Because of it, they're stuck with providing heavy shields and elaborate heat exchangers to extract power from the atom.

However, a new concept in nuclear fuel promises to break this barrier. High Temperature Materials, Inc., Boston, has coated tiny spheres of uranium fuel with pyrolytic graphite. This impervious jacket contains deadly fission by-products

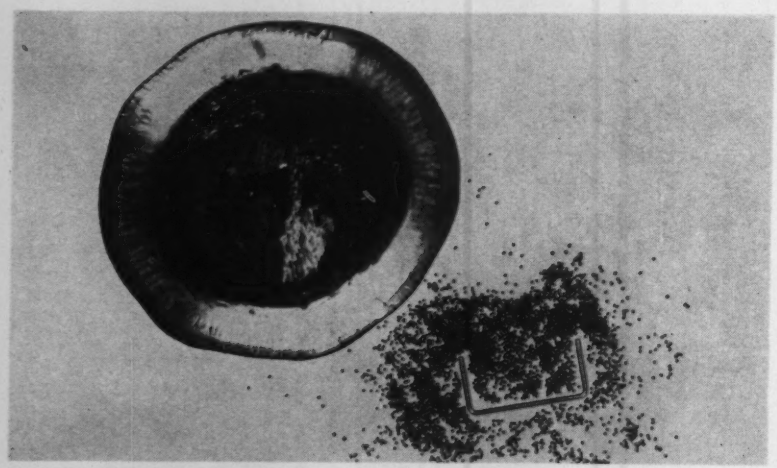
Great Expectations—Dr. Frank Pittman, director of the Atomic Energy Commission's Reactor Development Div., calls it ". . . one of the most exciting developments in the fuel business."

Speaking before the Atomic Industrial Forum, Dr. Pittman stated: "In one experiment, a graphite matrix containing uranium dioxide coated with pyrolytic graphite was irradiated at high temperatures. This was carried out for extended periods without any evidence of fission-product release. If this data is confirmed, the possibilities for these fuel elements are almost unlimited."

Past Problems—But before we try to evaluate the future, let's look at some of the problems that have plagued reactors in the past. Conventional units cope with radioactivity by isolating complete reactor stages.

They use heavy shielding, intermediate heat exchangers and complex purification systems. These units add up to a substantial part of total reactor costs.

Early in the game, designers toyed with the idea of a pebble-bed reactor. It would eliminate the need for much of this heavy equipment. Direct heat exchange is possible with this type of unit.



PACKED WITH POWER: A cluster of pyrolytic-graphite coated, fueled pressure spheres surround an office staple. Magnified 100 times, a single-particle cross section reveals the uranium-dicarbide core material.

More Snags—But here too, designers ran into snags. Pebble-bed reactors need a fuel particle. To retain fission by-products within a fuel particle, cladding strength is a must. This is so because the gas liberated by uranium breakdown keeps expanding in volume. Also, it's no secret that the strength of most materials decreases as the temperature climbs. These conditions impose severe limitations on pebble-reactor design.

As fuel burns up, internal pressure increases. As temperature goes up, the cladding strength decreases. The net effect of these two factors is to hold reactor-operating temperatures down. This wastes money. It means fuel must be reprocessed before it's fully burned out, because cladding can't take the pressure build-up.

Current chemical reprocessing of irradiated fuel costs a minimum of $56,000 per batch. But that's just the beginning. Since the best available metals are already used for cladding, these same metals have to do for processing-plant construction. As a result, plants dissolve at nearly the same rate as the cladding they process. This vicious cycle pushes equipment costs sky high.

Tough Enough — Now let's see how a pyrolytic-graphite coating breaks this impasse. First of all, it withstands extremely-high temperatures. Secondly, it actually gains in strength as temperature goes up. In other words, it takes the pressure build-up.

This means reactors can operate at the optimum power-generation temperature. Also, you can use the fuel until it's exhausted; not just until the pressure limits of conventional cladding are reached.

Another consideration is the cross-section of the cladding material. Cross-section is defined as the number of distintegrations produced by a given number of bombarding particles. Translated into English, this means that for a given radiation level, one cladding material will absorb more neutrons than another material.

Increases Efficiency — A reactor that uses cladding with a high cross-section must have highly-enriched fuel to maintain the reaction. Unproductive collisions with the cladding element waste this fuel. Thus, the low cross-section of pyrolytic graphite allows higher fuel burn-up. A table sums up these factors. In addition, pyrolytic-graphite coated particles are less costly to fabricate.

Looking Ahead—All these characteristics open the door to several exciting design concepts. The designer has the alternatives of:

1. Using enriched uranium as a fuel (this has appeal to countries whose economy cannot supply enriched fuel).

2. Employing enriched fuel and decreasing reactor size (of interest in volume-limited units such as transportation powerplants).

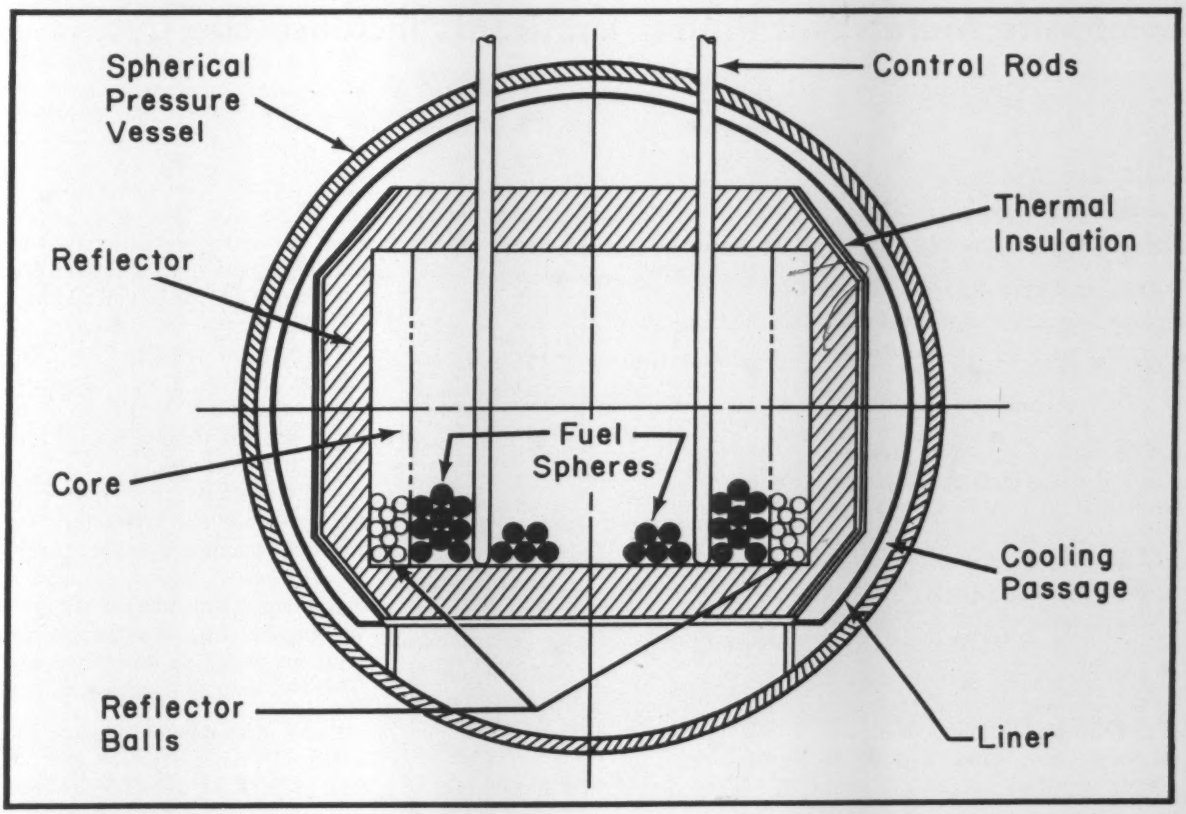
3. Using enriched fuels and increasing the lifetime of the fuel charge (for remote areas where downtime is expensive, and in general to reduce power costs).

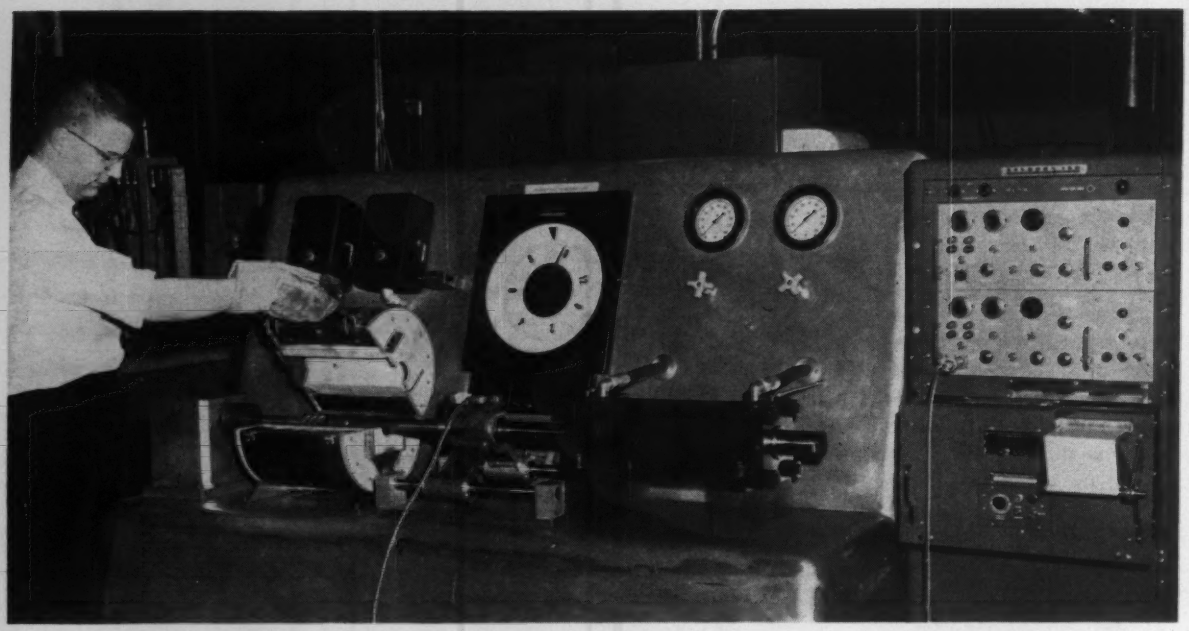
The future holds even more promise if these fuel particles live up to expectations. One interesting possibility is a turbine that operates directly from a gas-cooled reactor. This would bypass all heat exchanges and provide a terrific boost in efficiency and economy.

Compare Cladding Properties

Materials	Melting Point, °C	Relative Nuclear Cross-Section
Zirconium	1845	0.1800
Alumina	660	0.2150
Stainless steel, Type 347	1400–1427	2.0300
Beryllium	1315	0.0090
Magnesium	650	0.0590
Pyrolytic graphite	3650	0.0032

Pebble-Bed Reactor Uses Simple Shielding





DETERMINES LIFE: Axial-test loads of up to 15,000 lb can be applied against heated ball bearing screws.

Special Bearings Combat Heat

Composite Metals and Proper Lubricants Increase Life Cycles

By **G. A. Widmeyer**—Project Engineer, Saginaw Steering Gear Div., General Motors Corp., Saginaw, Mich.

At space-age speeds, mechanical parts have to function under heavy loads and high heats.

One company has found the answer. Recent studies pinpoint designs, materials and lubricants.

■ Conventional product design, standard materials, and customary lubricants are no match for the tortuous demands of today's atomic and space needs. The thermal barrier rates high among the problems resulting from nuclear-energy production and the high-speed flight of aircraft, rockets and missiles.

At ultrahigh heats, ordinary steels deteriorate rapidly and conventional lubricants prove almost useless. Attempts to reduce operating temperatures by cooling the actuators result in increased weight and lower overall efficiency.

Ball-bearing screws are in demand for high-temperature use. They provide a precise positioning method in converting rotary to linear motion with minimum power and size. These ball-bearing screws have a high degree of mechanical efficiency—about 80 pct to be exact.

Fills Needs—A typical high-temperature use for ball-bearing screws includes control-rod drives for nuclear reactors (both in and out of the radioactive areas). The screws are also used in gimbal actuators for rocket engines, and flight and/or engine controls for high-speed aircraft.

When the need for high-temperature actuators became a reality, it was found that little was known about the necessary materials and lubricants. Both must withstand the high contact stresses of ball bearings operating at high temperatures.

The Saginaw Steering Gear Div., General Motors Corp., Saginaw, Mich., started a R & D program to design and test various bearing materials and lubricants.

Numerous tests show that various materials are satisfactory for different operating temperatures. Specific needs depend on several conditions. These include: Operating temperatures, life requirements, loads, frequency of lubrication and other environmental conditions.

Check Materials — High-carbon, medium-chromium steels such as SAE 52100 are suitable for tem-

peratures up to 350°F. For higher-temperature operation, up to about 550°F, stainless steels such as Type 440 offer good corrosion and heat resistance.

Hot-work tool and die steels work well at heats up to 800°F. Good results have been obtained at temperatures up to 1000° F with races made from Haynes Stellite No. 25 cobalt-base material.

However, the balls were made of Haynes Stellite No. 3 cobalt-base material. These materials are non-heat-treatable, but they do harden rapidly when cold worked.

H-11 is heat-treatable. This material also suits the 1000°F work range. However, its oxidation-resistant properties aren't as satisfactory as the cobalt materials.

Lube Importance—The many different types of lubricants tried in various tests prove that actuator life is a function of the lubricant used. Good results are obtained when the assemblies are pre-lubricated. However, longer life is obtained when the units can be re-lubricated during their operation.

Oxides of certain lubricants coat the races with a protective film when used at a temperature above the lubricant's flash point. Silicone lubricants offer good results because of their high-temperature stability and resistance to oxidation and gumming.

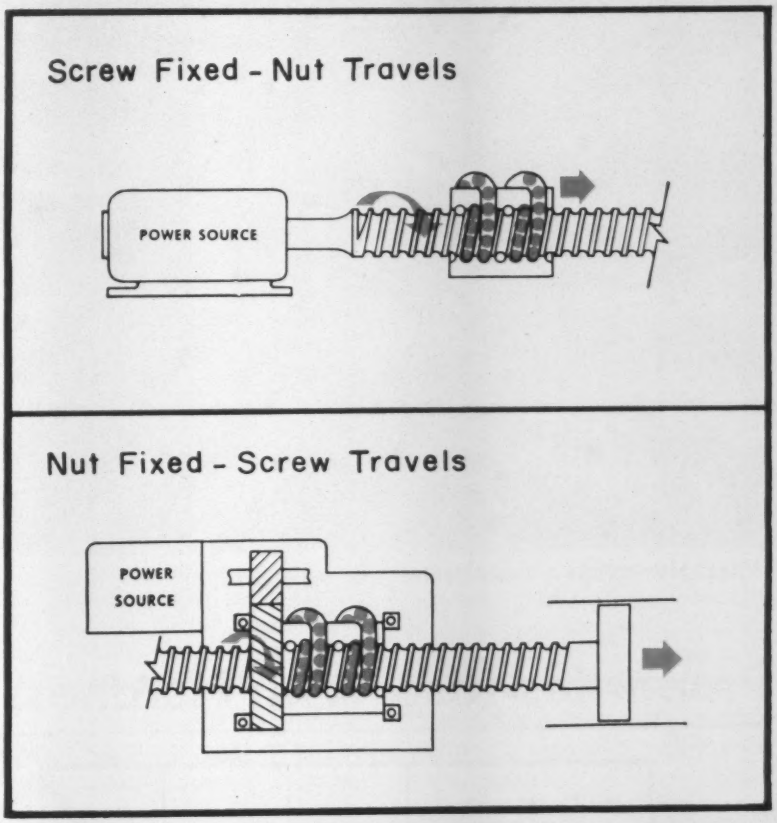
Design of a ball-bearing screw is also a critical factor in successful operation at elevated temperatures. High heats can cause uneven expansion of the screw and nut. This reduces radial clearance and places the balls under compression.

To prevent undue overloading, expansion must be considered. The assembly must be designed with a certain amount of looseness. Exact specifications vary with each specific application.

Special Testers—Included in the special test equipment built for this program are two furnaces. Here, ball-bearing screws can be operated under load at elevated temperatures. This simulates service conditions.

One furnace is capable of produc-

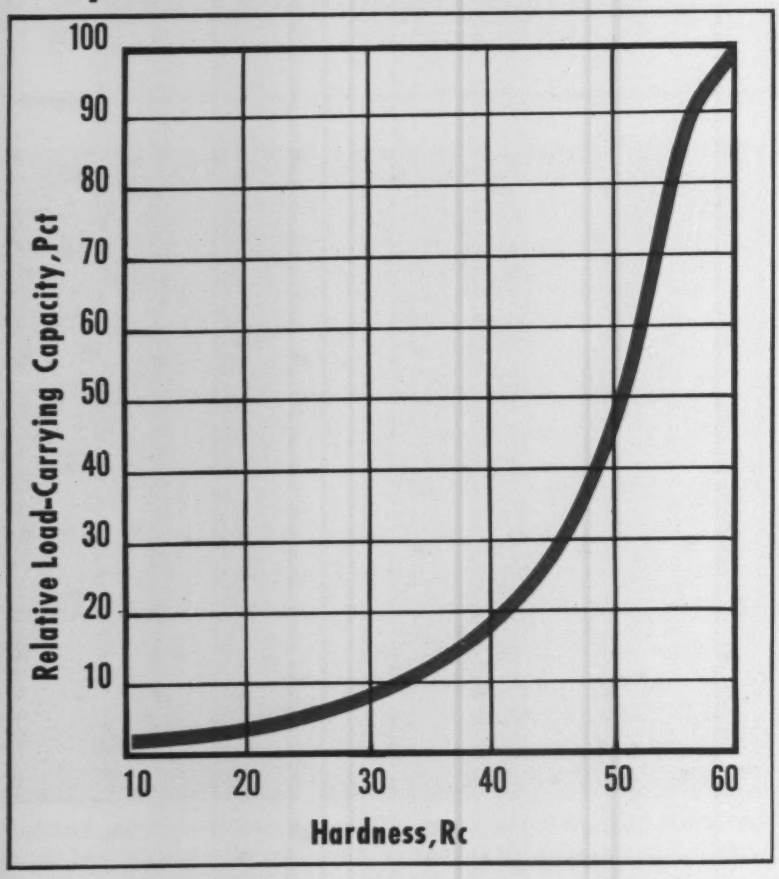
Bearings Work Both Ways



CONTROLLED STUDY: Long ball-bearing screws can be tested at 1400°F in a controlled atmosphere with this specially-designed test stand.

MANY SIZES: A broad field of uses requires versatility in design.

Properties Rise With Hardness



ing temperatures up to 1400°F. It can be used with a controlled atmosphere—employing an inert gas such as argon. The furnace's automatic controls permit continuous operation for accelerated life tests.

High-Temperature Study—Investigations were first directed toward race and ball materials that would be suitable for operation at elevated temperatures. Material requirements for any bearing hinge on the right combination of hardness, ductility, load-carrying capacity, wear resistance and machinability.

Other requirements also include properties that will insure uniformity, reliability, economy and optimum performance. For high-temperature uses, it's important that the materials also be capable of resisting thermal stresses, creep, stress corrosion and mechanical fatigue.

Hardness of the materials is another critical factor. Fatigue life, load-carrying capacity and resistance to plastic deformation increase, as wear decreases with higher material hardness.

Check the Needs — Short-time jobs, such as those encountered in some missiles and rockets, permit the use of low-alloy materials.

Tests were made on the various types of temperature-resistant materials to determine race-to-ball compatibility when bearing assemblies are made from different compositions.

One series of tests included ball-bearing screws and nuts made from AISI type M2, a high-speed tool steel. The balls, in turn, were made of Haynes Stellite No. 3 cobalt-base material.

Assemblies were subjected to a mean Hertz stress of 204,000 psi and a temperature of 750°F, while operating at 500 rpm.

Lubricant Found—Excellent results were obtained when a silicone-fluid lubricant was applied at 4-hour intervals. The lubricated parts were run for a total of 350 hours (7,900,000 revolutions). This life is equal to half that of a similar unit operating at room temperature.

Small Plater Handles Odd Jobs

Selective plating with a portable unit cuts the prototype costs at one switchmaker's plant.

The brush-on-type plater quickly repairs a machining error or touches up damaged surfaces.

■ Selective plating, sometimes referred to as brush, spot, or local plating is just what the doctor ordered on many a precision job. Often a machining error, found late in the assembly cycle presents a problem.

A table-top plating department ends many such production woes. All that's needed is a power pack, two leads, a stylus with a graphite anode and a small amount of electrolyte.

Almost any metal can be deposited—even alloys. The big benefit is in the fact that selected areas of an object can be plated without immersing all of it in an electrolytic solution.

Quick Protection—Inertia Switch Co., New York, plates components to protect them against corrosion. The ball, sleeve and contact which form part of the switch's electrical circuit are also selectively plated to keep contact resistance to a minimum.

Parts are cleaned ultrasonically before plating to remove machining chips and grease, then dried in an air blast.

The part to be plated is set up as the cathode by connecting it with a cable to the power pack. A second cable, fitted with a stylus, holds a graphite anode wrapped in absorbent cotton.

After the cotton is saturated with the proper electrolytic, the stylus is brushed across the area to be plated. Repeated brushings build up the desired deposit thickness.

Gold Control—Most switch parts are plated with gold or rhodium on a flash of copper or other suitable metal. Finish plate thickness ranges from 0.0001-0.0003 in.

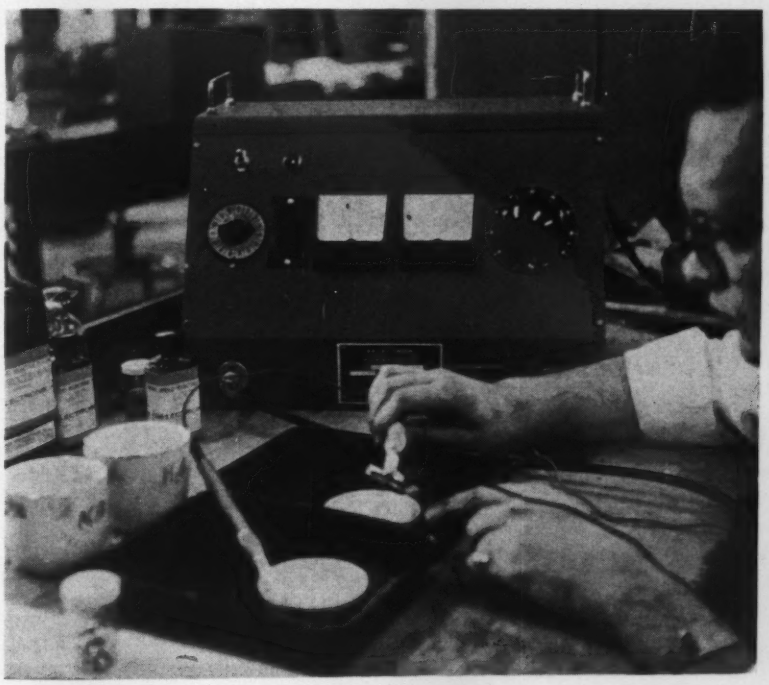
A typical operation consists of a seven-second cleaning cycle followed by gold plating for 45 seconds at 3½ v. Faster deposition can be obtained with higher voltages. However, lower plating rates produce a more desirable finish which does not need further grinding or polishing.

Walter Adamski, Inertia's plant manager says, "Even thought the plating unit is located in the middle of our assembly area, neither a hood nor special ventilation is needed. The selective plating solutions seldom contain cyanides or strong acids. Thus, they are safe to handle."

Cuts Small-lot Cost—The company does a large amount of prototype work. Here, and even on the large orders, customers require one or two sample switches for testing prior to shipment.

The selective plating method saves the company both time and money on small lots. Selectron Ltd., New York, manufactures the high-speed selective plating system with the claim that its applications are numberless. Often as not, the unit can even handle full-production runs.

Filling in porosity, balancing of rotary components, touch-up plating and masking prior to carburizing or nitriding are just a few points to consider. One heat treater reports that only 0.0005 in. of selective-plated copper (alkaline) is sufficient to prevent hardening of given areas during most carburizing operations. Printed circuit users repair defective plating on assembled circuit cards with the unit.



PLATES QUICKLY: Up to 0.0005 in. of gold can be deposited in one minute with the selective plating unit. This inertia switch uses 0.0003 in.

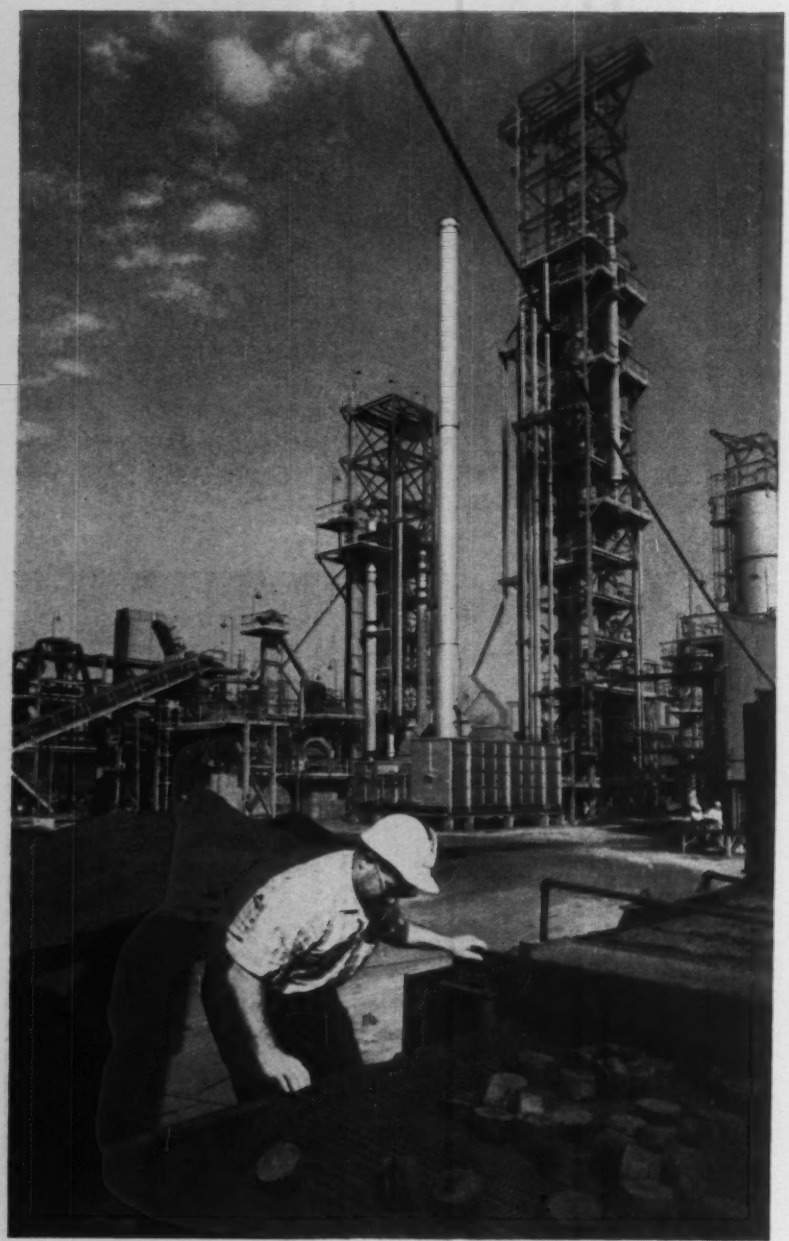
H-Iron Passes the "Acid Test"

There has been lots of talk about using hydrogen to reduce iron ore into metallic iron.

The successful completion of a test program proves out both methods and end products.

■ Bethlehem Steel Co. has just announced the successful completion of its experimental H-Iron program. All necessary data have been obtained and no further operations are scheduled for the present at the company's H-Iron pilot plant in the Los Angeles area.

Further exploitation of this process depends on the need for primary iron-production facilities. Bethlehem has no immediate plans for these facilities at the West Coast installation.



IRON BRIQUETTES: In briquette form, iron powder emerges from a passivating furnace. Hydrogen gas in fluid beds produces 95 pct reduction.

Joint Venture—The steelmaker's interest in the process, jointly developed with Hydrocarbon Research, Inc., the exclusive licenser, dates back more than 10 years.

At that time, the steel company began searching for a way to produce iron in areas where metallurgical coke and limestone aren't readily available. Both of these materials are necessary blast-furnace ingredients.

Working with Hydrocarbon's personnel, Bethlehem's scientific and engineering people devised a method whereby iron ore is reduced by hydrogen gas to yield metallic iron. This method was first checked out in a small pilot plant at Trenton, N. J.

Proof of Pudding—Bethlehem then decided to build a bigger pilot H-Iron plant which would be large enough to permit a convincing demonstration. The company wanted to prove out both the process and the characteristics of the end product when charged into steelmaking furnaces.

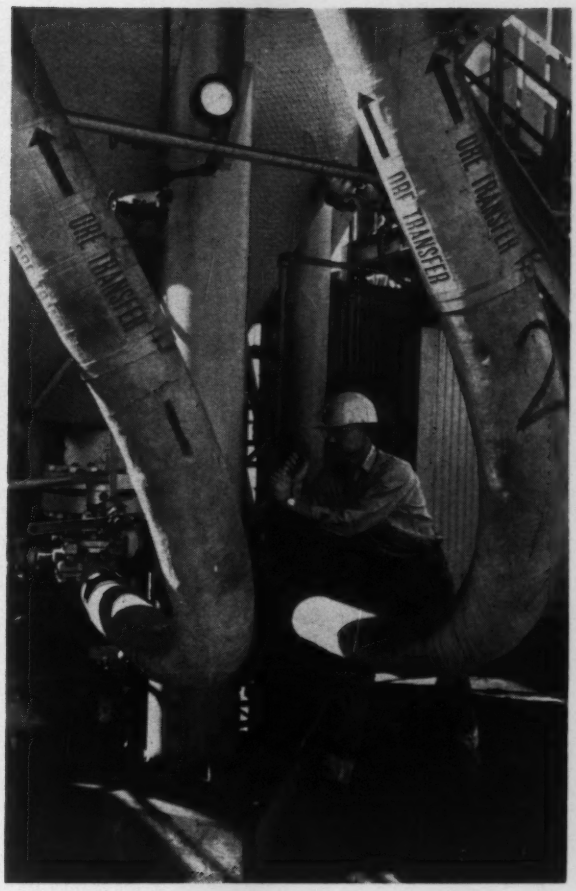
To that end, a pilot plant was constructed. Erected at the company's southern California facilities, it can produce at the rate of 110 tons per day.

This location was chosen because of potential interest in the application of the process on the West Coast. The company now has no blast furnaces in this area.

The H-Iron pilot plant resembles an oil refinery. It consists of three major units, an oxygen plant, a hydrogen plant, and an iron-reduction plant.

Forms Metallic Iron—Oxygen is combined with natural gas to pro-

HEAT AND SERVE: A special furnace heats the hydrogen which is used in the purification process.



ORE TRANSFER: At ground level, an operator transfers ore from charge hoppers to the reduction vessel.

duce hydrogen. The hydrogen, in turn, acts upon the iron ore in the reduction plant to form metallic iron.

During actual production, pulverized iron ore is fed into the top of a cylindrical-steel vessel. This vessel, with all its equipment, weighs 238 tons. It measures 122½ ft high. Under pressure, hydrogen is introduced into the bottom of the vessel.

The hydrogen and iron ore meet in a series of four fluid beds. When they meet the temperature is about 850°F and the pressure is 440 psi.

Becomes Briquettes—Upon discharge from the vessel, the iron powder is briquetted and passivated in a special furnace at 1600°F. This prevents the powder from reoxidizing.

The rated capacity of the pilot plant is 110 tons per day. But, in the final phases of the program, it turned out 121 tons per day of 95-pct plus reduced powder.

It's worth noting the ability of the process to produce highly-reduced iron powder at low-operating temperatures.

During the test runs, the oxygen and hydrogen plants operated as scheduled. Both plants boasted high availability. A number of changes were made in the reducer. Toward the end of the program, it also operated with high availability.

Production Runs — Full-scale melting tests of briquettes in electric furnaces show that a consistent degree of reduction results in a consistent practice. With 95-pct reduced H-Iron briquettes serving as 30 pct of the charge, differences in heat time, power consumption, and fluxes—as compared with scrap charges—are small. Above 30 pct of the charge, the gangue in the ore causes some increase in these factors.

Yields for 95-pct reduced H-Iron heats are the same as for non H-Iron heats. Lower degrees of reduction increase heat time and power consumption; but they decrease yield.

Of interest are the results of production heats made in the final phases of the program. H-Iron powder, not briquetted or passivated, was charged directly into an electric-arc furnace.

Up to 40 tons of 95-pct plus reduced powder—40 pct of a charge—melts smoothly with normal yield and slight increases in heat time, power consumption, and fluxes.

Another advantage of H-Iron over scrap is its freedom from contamination by other metals.

Oxygen Steelmaking Grows

Interest in the basic oxygen process continues to grow — both in the U. S. and abroad.

One reason is the fast production rate.

▪ Key to the growth of oxygen steelmaking throughout the world has been the availability of low cost oxygen—in tonnage amounts. And it's quite possible that the cost of oxygen will be further reduced.

So spoke A. B. Wilder, chief metallurgist, National Tube Div., U. S. Steel Corp., Pittsburgh. The occasion: The recent meeting of the National Openhearth Steel Committee of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

Worldwide Interest — About 25 countries are using or installing oxygen steelmaking processes, reports Mr. Wilder. Many of these countries are industrially undeveloped when compared with the United States, he points out.

"However, with a basic industry such as steel and with modern steelmaking processes using oxygen, the economy of many of these countries should improve."

Another key point is that installation and operating costs for oxygen steelmaking facilities are low compared with modern openhearth facilities, according to Mr. Wilder.

Capacity Is Factor—New facilities are also under construction or being placed in operation in the United States. Present steelmaking capacity in the U. S., however, will retard greater use of these processes, believes Mr. Wilder. However, this situation will be temporary and will depend to some extent on local conditions.

Oxygen steelmaking is also catching on in the U.S.S.R. Furnaces in Russia range from 10-45 tons. It's expected, though, that 200-ton converters will be installed within a few years.

Red China is also interested in oxygen steelmaking. And when tonnage oxygen becomes available, oxygen steel will probably be produced there.

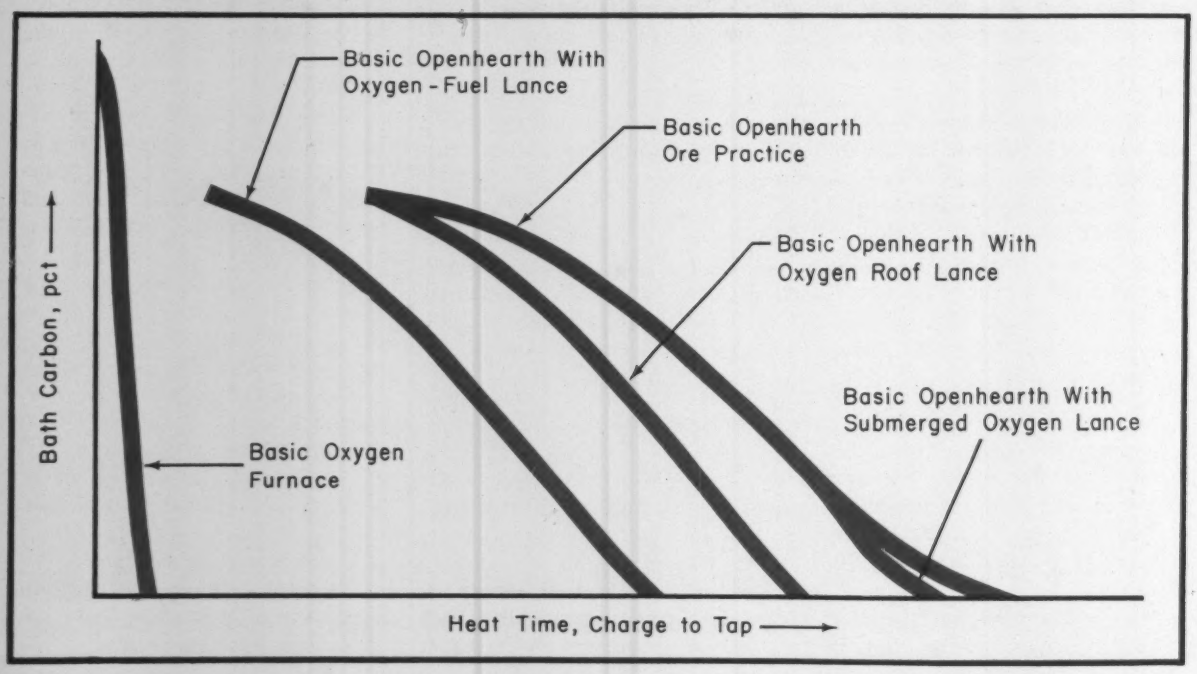
Take Your Pick—Several types of lances can be used for injecting oxygen. In addition to the usual water-cooled lance, there are the lime-powder and oxygen-fuel lances.

The chart compares melting times for steelmaking by both basic-oxygen and basic-openhearth processes. Note how the use of oxygen speeds the operation.

What does the future hold for oxygen steelmaking?

With improved handling facilities including automation, new steel melting practices, better refractories, and possibly new oxygen steel processes, steel with top quality and at even lower costs should become available, says Mr. Wilder.

Compare Speeds of Refining Practices


Basic Openhearth With Oxygen-Fuel Lance
Basic Openhearth Ore Practice
Basic Openhearth With Oxygen Roof Lance
Basic Openhearth With Submerged Oxygen Lance
Basic Oxygen Furnace
Bath Carbon, pct
Heat Time, Charge to Tap

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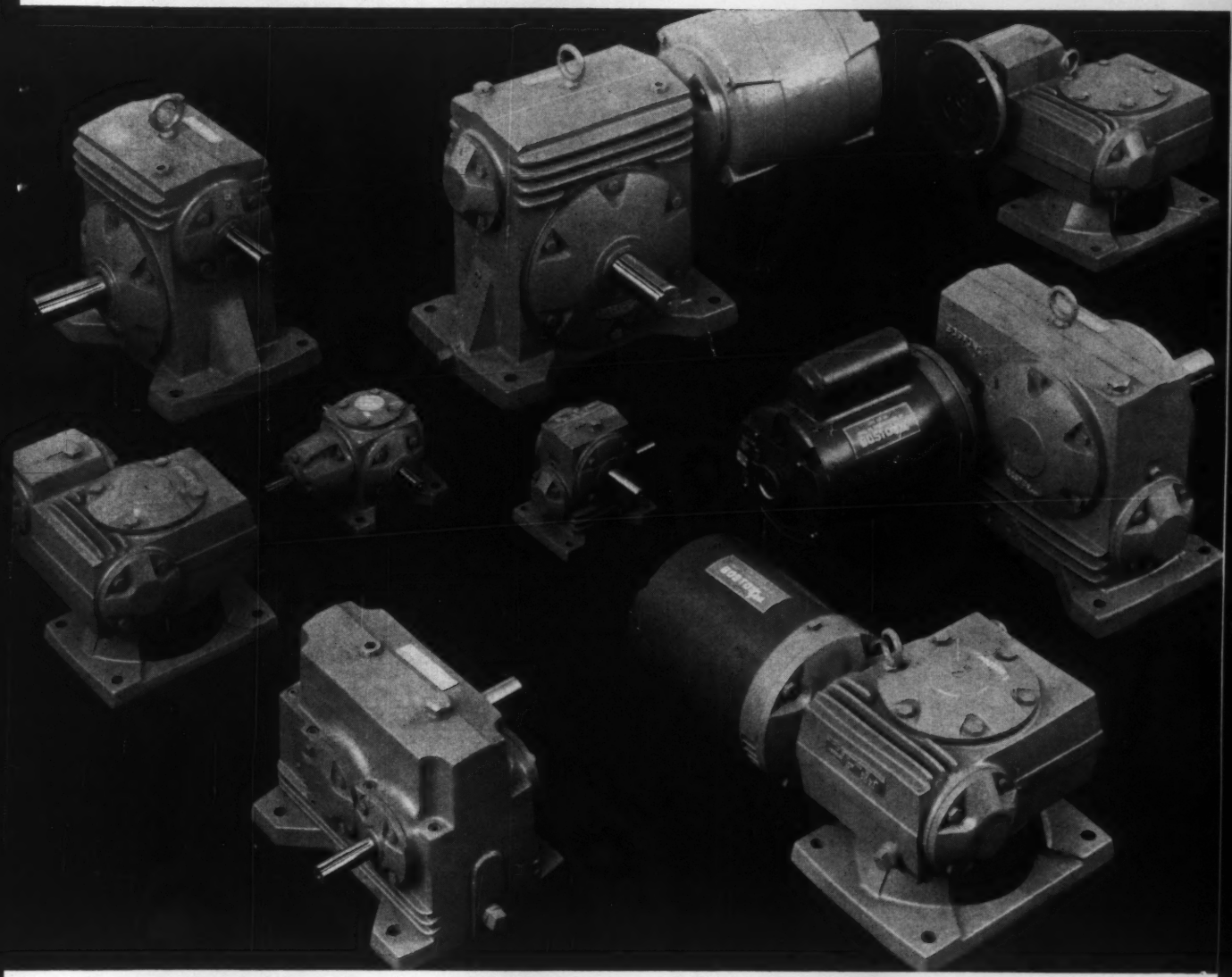

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NEW PATENTS

Powder Preparation

Preparation of metal powders, J. J. Grebe and J. F. Miller (assigned to Dow Chemical Co.), June 27, 1961. In the production of low-sulphur, low-phosphorus iron powder, ground taconite ore is admixed with ground soft coal and flake sodium hydroxide. This mixture is fired at about 1225°C for 25 minutes. Then the spongy calcine is cooled and pulverized. Magnets recover the iron powder. U. S. 2,990,267.

Magnetic Separation

System for separating magnetic-susceptible particles, P. E. Cavanagh and C. W. Hedberg (assigned to Research-Cottrell, Inc.), June 27, 1961. An improved grinding, classification, and magnetic-concentration system produces from low-grade magnetic iron ore a concentrate containing 60 pct or more iron. U. S. 2,990,124.

Soft Magnetic Alloy

Process for making "soft" magnetic-alloy articles having improved resistance to oxidation and corrosion, E. R. A. Josso (assigned to Soc. Metallurgique d'Imphy, Paris, France), Mar. 22, 1961. The alloy consists of 12-40 pct Cr, 0-2 pct Mn, not more than 0.2 pct C, and the balance substantially all Fe. British 863,730.

Iron-Oxide Reduction

Direct reduction of iron oxide by hydrocarbon, W. K. Lewis (assigned to Esso Research & Engineering Co.), June 20, 1961. A process for the direct reduction of iron oxide ore uses hot hydrocarbons admixed with higher-temperature, partly- oxidized hydrocarbon products. The partly-oxidized hydrocarbons are formed in a fluidized-solids combustion zone. U. S. 2,989,396.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Testing Machines

Details and specs on a complete line of testing machines are the main content of a new catalog. It's 36 pages describe the entire line and delve into the advantages of an unusual drive system that assures positive testing speeds. (Tinius Olsen Testing Machine Co.)

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Materials Flow

The "warehousing" approach to management of materials flow is detailed in a new 16-page brochure. It illustrates equipment and techniques for live storage and transportation of raw materials and finished products. Most important, it offers ideas for manufacturers, wholesalers and retailers. (The Rapids-Standard Co., Inc.)

For free copy circle No. 2 on postcard

Fan Information

In four pages, a new bulletin describes a fan company's heavy-duty, mid-draft inducer. The unit comes in seven sizes to handle a fuel burning rate of 12-130 gph of fuel oil, or the equivalent in other fuels. Specifications, dimensions, data and formulas are also given. (Stamford Fan Co.)

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Process Thickeners

This 24-page brochure describes a complete line of thickeners for chemical, metallurgical and industrial processing. Single- and multiple-compartment devices are described. These units have both center-drive and perimeter-drive rakes in a variety of configurations for unit operations in all the process industries. (Dorr-Oliver Inc.)

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Information on Pumps

Six, picture-laden pages present pertinent information on a line of positive-displacement pumps. These units boast infinite adjustment in several ranges. Positive displacement is controlled by an adjusting screw. (Airmatic Valve, Inc.)

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Shear-Pin Protection

A 4-page catalog illustrates and describes sprockets with shear-pin hubs and split-taper bushings. Although the shear-pin hubs are perfect for sprockets, they can also be used with special sheaves, gears, clutches, etc. These newcomers provide shear-pin protection for just about any type of drive. (Browning Mfg. Co.)

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Soldering Irons

In a new release, a total of 80 soldering-iron models in seven distinct types are covered. These include units from 20-700 watts with $\frac{1}{8}$-$\frac{3}{4}$-in. tips. (Hexacon Electric Co.)

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Basic Finishing Unit

In its four pages, a fully-illustrated brochure tells all about 19 basic types of electroplating, polishing and spray-painting equipment. (J. Holland and Sons, Inc.)

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Graphite Globe Valves

Technical information on impervious-graphite globe valves covers both 1- and 2-in. valves. It comes in a two-page bulletin which also

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 8/3/61

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lists features such as positive control of corrosive fluid flow; immunity to thermal shock; armored construction; self-lubricating, nonrotating spindle; and non-sticking, non-galling valve seat. (National Carbon Co.)

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Calculates Clearance

A convenient calculator quickly determines clearances of slitter knives. The calculator consists of a double plastic wheel. When it is set so that an arrow points to the thickness of material, windows show horizontal and vertical clearances. The back of the calculator gives clearance suggestions for side trimming strip and plate steel. (Heppenstall Co.)

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Variable-Speed Drives

Two types of motion-control, variable-speed sheaves are covered in a 16-page catolog. It pictures and describes "MS" sheaves rating from 2-15 hp and "MCS" sheaves, from 7.5-20 hp. "Sure-Grip" companion pulleys and sheaves, variable-speed belts, motion-control motor bases and "Quick-Slide" motor bases are also covered. (T. B. Wood's Sons Co.)

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High-Purity Hydralene

The four pages in a new bulletin explain how hydralene-gas producers provide a steady source of high-purity hydrogen gas. Material costs are about 10 pct that of cylinder gas. In addition, the bulletin discusses hydralene-gas applications in metallurgical, chemical and food processing industries. (General Electric Co.)

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Power-Cylinder Data

A new bulletin embraces under one cover, a complete line of air and hydraulic cylinders. It aids in the selection of cylinders by size, thrust, bore, stroke, and mounting style. (Flick-Reedy Corp., Miller Fluid Power Div.)

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Buyer's Guide

A new 1962 buyer's guide is of interest to all industries which handle or process liquids or gases. Each section of the book contains concise engineering data in chart or tabular form. (Pfaudler Permutit Inc.)

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Casting USS T-1 Steel

A four-page brochure covers the physical and mechanical properties of castings made to the USS T-1 steel composition. Covered in the brochure are the welding and machining characteristics of cast T-1, as well as its heat treatment. High-temperature properties and corrosion resistance also receive mention. (ESCO Corp.)

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Horizontal Mixers

A 12-page technical catalog describes horizontal mixers for free-flowing, granular materials. Design, technical and dimensional data are included for mixers ranging in capacity from ½-500 cu ft. The catalog covers both laboratory models and production units. (The Young Machinery Co., Inc.)

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Valve Bulletin

Line drawings are used to illustrate nomenclature and general construction features in a new eight-page bulletin. The subject is a line of high-pressure valves. These valves come in three basic types: Globe, check and relief. (Farrel-Birmingham Co., Inc.)

For free copy circle No. 17 on postcard

Testing Reference

For those interested in research, development or quality control, a new eight-page folder lists 1239 physical-testing machines for all industries. The equipment list has been compiled from worldwide sources. It should be a valuable reference for technical and purchasing personnel, government agencies and educational institutions. (Testing Machines Inc.)

For free copy circle No. 18 on postcard

Machine-Tool Guide

This 20-page catalog condenses specs and illustrations on an entire line of machine tools. It discusses milling machines, grinding machines, automatic and hand-screw machines and turret-drilling machines. (Brown & Sharpe Mfg. Co.)

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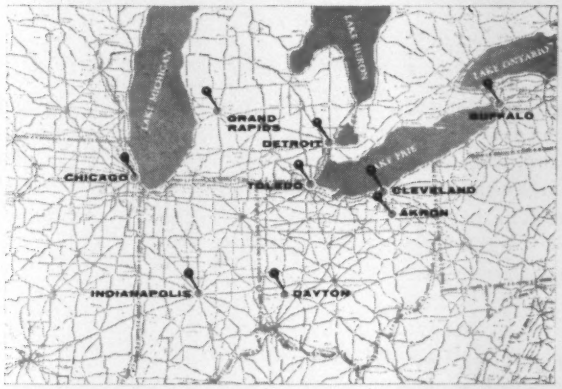

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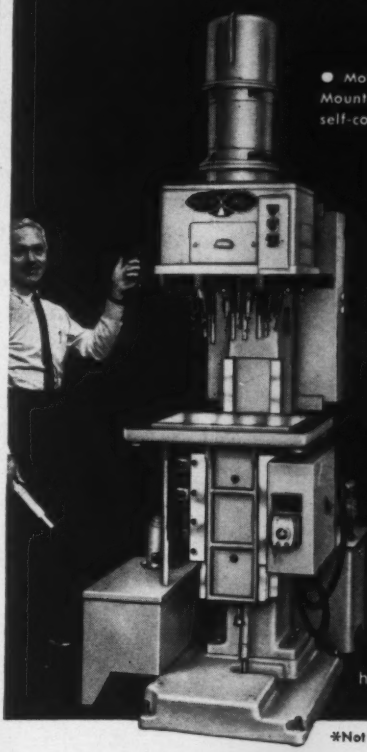

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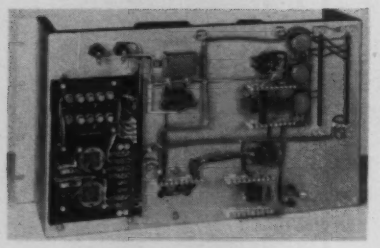
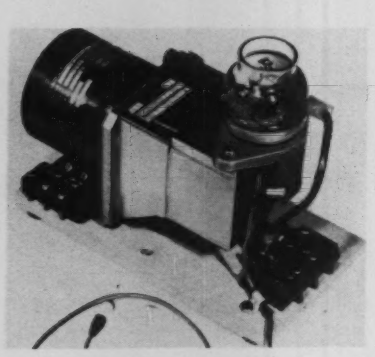
New Materials and Components



Servo-Control System Features Electronic Units

According to the manufacturer, this new electronic system is the only one of its kind fully transistorized and designed specifically for use with servovalves. The package consists of a power supply, an operational amplifier, a carrier generator, a power demodulator and a chassis. In some uses, all these components won't be necessary. Therefore each component plugs in or out of the chassis as required. (Moog Servocontrols, Inc.)

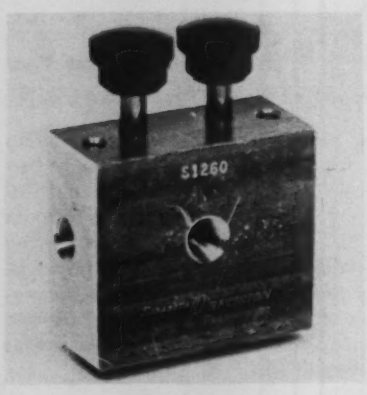
For more data circle No. 20 on postcard, p. 83



Thermoelectric Cooler Aids Infra-Red Detector

Lowering the temperature of an infra-red detector cell enhances its sensitivity. That's why Pesco Products has mounted an indium-antimonide cell on a four-stage, cascaded, thermoelectric cooler. This cascade cools a 15-milliwatt load to —78°C when its used with a heat sink at +27°C. Thermoelectric cooling has the advantage of being completely electronic in operation. You can forget about malfunctions caused by pumps, filters, tubing and small orifices. These cooling units require no more adjustment or service than an ordinary power supply. Another advantage is the absence of moving parts. (Pesco Products Div., Borg-Warner Corp.)

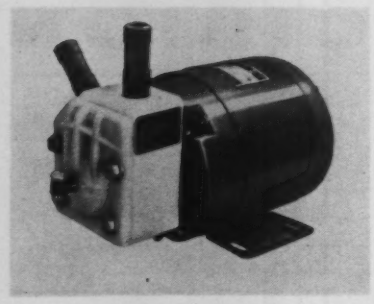
For more data circle No. 21 on postcard, p. 83



Brake Valve Substitutes for Non-Slip Differential

Here's a new unit that does away with costly non-slip differentials on materials-handling and off-the-road vehicles. It's a differential brake valve that lets the operator shut off the flow of brake fluid to the wheel that has traction. Thus, when one wheel is spinning, he can depress the brake pedal and lock only the spinning wheel. Then the vehicle can proceed under its own power. Only one wheel drives, until both wheels are in traction again. The device has two, spring-return, two-way valves which share a common pressure port. This port links up with the master brake cylinder. The differential brake valve suits hydraulic-oil or brake-fluid systems. It installs easily in either system. (Sarasota Precision Products, Inc., a subsidiary of Racine Hydraulic & Machinery, Inc.)

For more data circle No. 22 on postcard, p. 83



Low-Cost Plastic Pump "Squeezes" Fluids

In a new plastic unit, the rotor mounts on an eccentric cam to supply pumping action. Its rotation within the liner promotes a progressive squeegee action on fluid trapped between the liner and the body block. This method has many advantages. In the first place, construction is compact and low in cost. Secondly, there's no need for stuffing boxes, shaft seals, valves or gaskets. Since metal parts don't contact the fluid, contamination is nil. Also, the pump is self-priming; it operates wet or dry; and it can handle slurries or thick fluids. (Vanton Pump & Equipment Corp.)

For more data circle No. 23 on postcard, p. 83

Rubber-Like Compound

Three years of research have led to the development of a new family of rubber materials. Unlike other rubber or synthetic-rubber compounds, the materials need no heat or pressure. They consist of two liquids which are simply mixed together. This mixture cures at room temperature to form a tough, highly-resilient product. Forms produced are non-shrinking. This means thick sections can be poured or cast at one time. It is a new development which should have many uses wherever present specifications call for rubber or synthetic rubber. (Devcon Corp.)

For more data circle No. 24 on postcard, p. 83

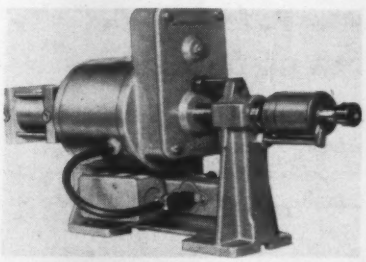
Guards Delicate Wiring

Shielded controls and threaded construction provide unusual protection for the delicate wiring devices housed in these explosion-proof fittings. As you might expect, they're also dust and weather proof. The fittings come with various standard wiring devices including tumbler switches, manual motor starters, push-button stations, selector switches and pilot lights. All operating controls have threaded, stainless-steel shafts. They mount on the front face of the body. Each is equipped for padlocking in any position. (The Pyle-National Co.)

For more data circle No. 25 on postcard, p. 83

Tapping Unit

This small automatic-tapping unit has a capacity range from #4-40 through #10. It's electric-motor-driven spindle employs an air cylinder for the feed. Thus a single-direction motor is used with reversing attachment. Tap-speed range is 750-3000 rpm in seven steps. Since the unit is compact, it can easily be built into special machines. (The Electro Mechano Co.)



For more data circle No. 26 on postcard, p. 83

Changes Welder Output

Sixty second conversion of ac current to dc welding current is achieved by a recently improved convertor. It comes in two models. One is rated at 300 amps on a 40-pct duty cycle or 250-amp on a

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Through investment casting, your metal parts can be made in a wide range of ferrous, nonferrous and super alloys. Results — better performance...longer life...lower costs!

This part for can making machinery now cast in a non-machinable alloy offers a very high degree of resistance to wear and corrosion. Results — costly parts replacement problems ended.

Better alloys often cost no more than the "inexpensive" ones when your part is an investment casting. What counts is *castability*, not machinability.

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CLANG OF SCRAP...
dull thud in cost of possession

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Yet maintaining your own large inventories of steel and other metals can make the scrap hopper ring long and loud . . . pound big dents into an already-battered profit picture.

Consider this solution that is increasingly popular with alert steel users . . .

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To help your production and cost accounting people in figuring the true cost of steel stocks, ask your steel service center salesman for the booklet, *What's Your Real Cost of Possession for Steel?* Or write to Steel Service Center Institute.

COST OF POSSESSION . . . *to determine your own cost of possession for steel in inventory, consider all these factors:*

Cost of capital: inventory, space, equipment—Cost of operation: space, material handling, cutting and burning, scrap and wastage—Other costs: obsolescence, insurance, taxes, accounting

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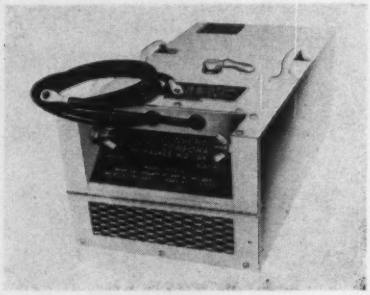
DESIGN DIGEST

60-pct duty cycle. The other model rates at 500 amp on a 45-pct duty cycle or 450 amp at a 60 pct cycle. Portable and completely self-con-

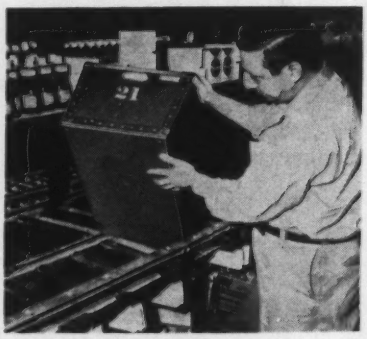


tained, the convertor is quickly placed on top or on the side panel of any ac welder. (A. O. Smith Corp.)

For more data circle No. 27 on postcard, p. 83

Conveyor Receptacles

Duplex - bottom construction on vulcanized-fiber conveyor receptacles provides a flat, smooth surface for effective conveyor travel. The duplex bottom starts with a 5-ply vulcanized fiber and plywood base plate, about ½-in. thick. This plate is riveted to the normal fiber bottom of a receptacle. Then the plate edges are beveled and rivet holes are countersunk to assure snag-free movement over the conveyor. De-



veloped specifically for roller and skate-wheel conveyors, the duplex bottom provides a smoother ride than conventional shoes or runners. (National Vulcanized Fibre Co.)

For more data circle No. 28 on postcard, p. 83

Auxiliary Transmission

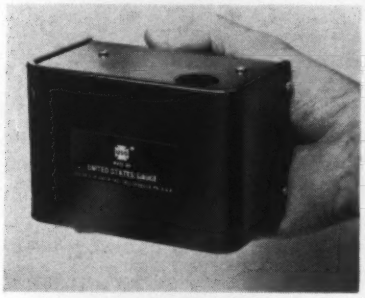
Boasting quiet operation and easy shifting in all gear positions, a new

4-speed auxiliary transmission has a nominal torque rating of 550-600 ft-lb, but weighs only 340 lb. It's designed for use with standard 4- or 5-speed transmissions in the 400-600 ft-lb range. Also, a top-mounted power take-off is available to operators of heavy-duty winches, pumps and other vehicle-mounted, materials-handling devices requiring full engine torque. (Dana Corp.)

For more data circle No. 29 on postcard, p. 83

Safety Switch

A water-level safety switch prevents pump damage due to insufficient liquid at the source. The new switch suits installations where



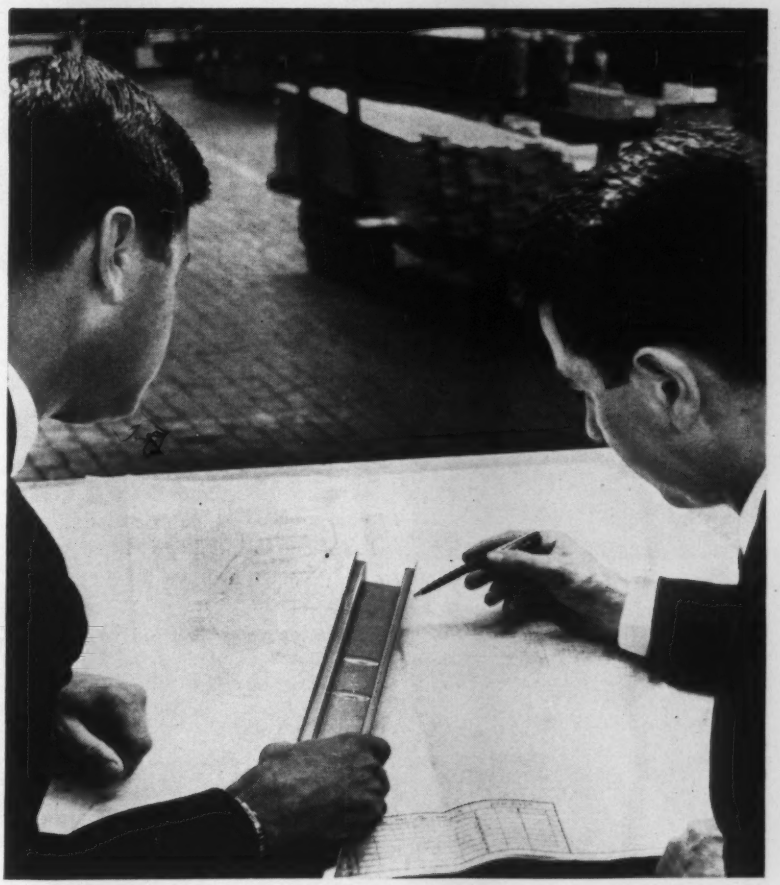
bearings, packing glands and motor windings depend on pumped water for lubrication and cooling. Insufficient water flow could damage these parts; but not with this new safety switch on the job. It senses liquid flow by discharge pressure measurements. Then it automatically shuts the system down when the water level gets too low. (United States Gage Div., American Machine & Metals, Inc.)

For more data circle No. 30 on postcard, p. 83

Provides Random Noise

A new series of random-noise sources provide random "white" noise with Gaussian amplitude distribution. The units localize an octal socket for both standard console-power input and random noise output. Thus, great design flexibility is available for system and laboratory applications. Random noise simulates electrical signals and disturbances, sounds, and vibrations for testing. (H. H. Scott, Inc.)

For more data circle No. 31 on postcard, p. 83



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Steel

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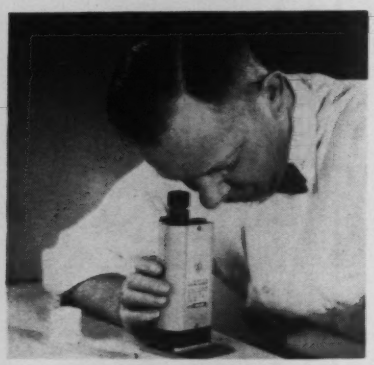
New Equipment and Machinery

Automatic Gyrator Promotes Continuous Output

Now, continuous, high-production finishing of metal, plastic or ceramic parts is a reality. A new automatic vibratory gyrator makes it possible. The work feeds into and out of these machines automatically. Parts are automatically cleaned, screened and recirculated. Cleaning compound and water are also added mechanically. In other words, you don't have to be anywhere near the machine. It will run without supervision. The newcomers operate with the same gyratory action and special air-cushion suspension as standard units. But you can arrange for continuous conveyance of large or heavy parts through these machines. (Pangborn Corp.)

For more data circle No. 50 on postcard, p. 83



Accurate Gage Speeds Detection of Surface Flaws

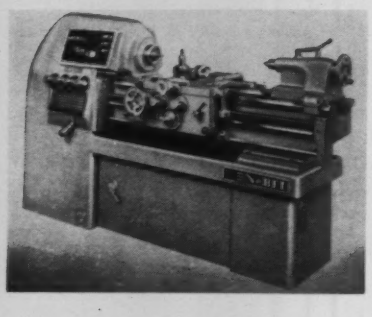
Here's a new instrument that measures scratches, grooves and other indentations on flat or curved surfaces. It provides a precise, inexpensive and non-destructive means to determine whether such surface indentations fall within allowable limits. Of course, it works equally as well for raised portions. Specifically, the scratch-depth gage was designed for the inspection of materials where scratches could result in structural failure. Examples include wing skins of aircraft and high-pressure tubing. Other uses exist in quality-control inspection for the metals and plastics industries. Accuracy is 0.0001 in., or 5 pct of the depth, whichever is greater. The gage also shows scratch contour. (Bausch & Lomb Inc.)

For more data circle No. 51 on postcard, p. 83

Tool-Post Grinder Assures Complete Visibility

By eliminating bulky electric motors, belts and pulleys, a new tool-post grinder insures complete visibility. This is possible because the quill completely encloses the 1-hp motor. Air supplies the power. Although top speed is 18,000 rpm, the motor operates through 4:1 reduction gears. Thus, maximum spindle speed is 4500 rpm. Grinding speed changes are a simple matter. Just adjust the air-supply valve. Also, one quill serves for both internal and external grinding. The absence of a drive assembly means that work is always accessible. (Gilmore Industrial Grinders, Inc.)

For more data circle No. 52 on postcard, p. 83



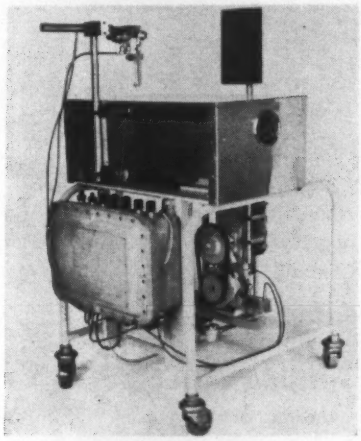
Precision Lathe Features Variable Spindle Speeds

An improved high-speed lathe combines infinitely-variable spindle speeds with constant horsepower. Its coaxial-spindle design teams up with a speed-variator drive unit to provide an infinite selection of spindle speeds from 43-3500 rpm. Constant, full-drive horsepower is delivered throughout the entire range. Output speed is kept accurate to within 2/10 of 1 pct. Thus, maximum torque is available at low speeds where it's needed the most for heavy cutting. At high speeds, precision balance and low vibration assure ultra-fine finishes. (Nebel Machine Tool Corp.)

For more data circle No. 53 on postcard, p. 83

Three Axis Spraying

Here's an automatic panel-spraying and lapping machine that permits three axis spraying and lapping. It handles test panels on a fully-automatic basis without operator attention. Completely explosion proof and designed for ease of port-

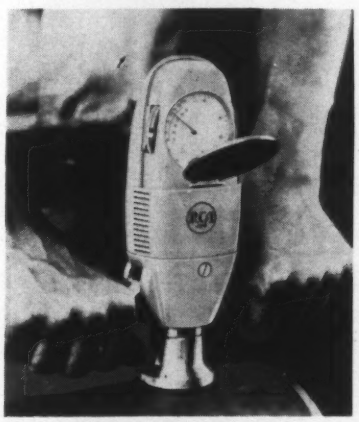


ability in laboratory use, the unit is being used in color-control work in the automotive industry and wherever accurately-coated test panels are essential. (Spraymation, Inc.)

For more data circle No. 54 on postcard, p. 83

Hardness Tester

This unique instrument excells as a standard bench-type unit for inspecting small parts. When it's re-



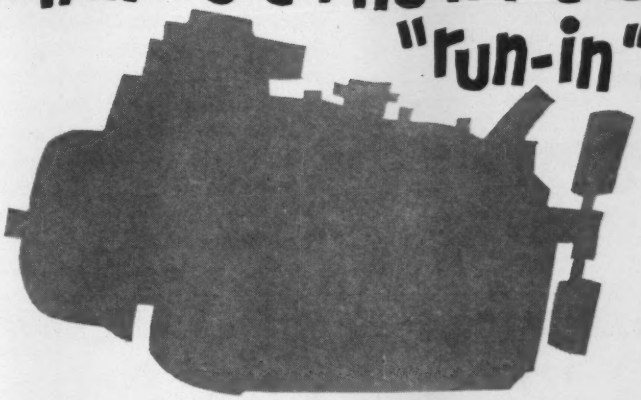
moved from the stand or frame, the main body can be equipped with hand grips. This arrangement lets you check the hardness of large objects, even those with complicated contours. Readings are given in both Vickers (40-1000) and C scales (20-70). In addition to steel, the instrument checks soft metals such as aluminum or copper. However, thickness must be more than 0.6 mm. (Radio Corp. of America)

For more data circle No. 55 on postcard, p. 83

Automatic Loader

A new vacuum-operated, automatic-transfer unit has been specially constructed to feed a stretcher-leveller. The unit will load and unload aluminum sheet and plate, up to 78 in. wide and 34 ft long, by a vacuum not exceeding 2,000 pounds per lift. The unit may be adapted to similar transfer-feeding and handling problems. The sheet feeder is an overall self-contained unit with integral wiring, vacuum power source, control panel, gear-motor drive and rack assembly, and a lifting mechanism. The lift consists of a load bar, dual air cylin-

When close fits have to be "run-in"...



consider Lubri-Case

(-the sulphur case lubrication process that eases run-in of ferrous precision assemblies)

Close tolerance assemblies with ferrous mechanical parts produce the problem of break-in without breakdown of lubricity between design elements. Lubri-Case treatment of mechanical parts provides for quicker run-in with little or no scuffing, scratching or seizing.

For such parts Lubri-Case, a sulphur case treatment, produces a case high in sulphur on most ferrous materials imparting load bearing, long wearing, lubricating properties even in castable and machineable low cost iron and steel. Lubri-Case has been use tested in many applications under high speeds, heavy loads, elevated temperatures and close tolerances.

Drever Company, heat treating specialists since 1939, can Lubri-Case process your "specials" or your production quantities. Write or phone for further details.

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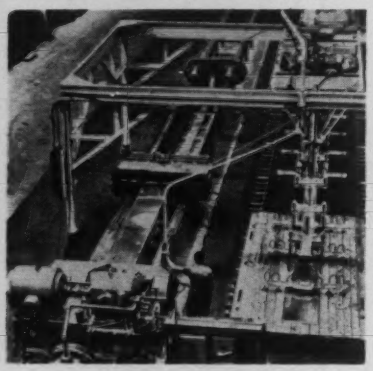
ders, vertical gear racks and gears with a connecting shaft. This arrangement prevents creeping of



cylinder action. It also provides load equalization. (Vac-U-Lift Co.)

For more data circle No. 56 on postcard, p. 83

Roughs and Finishes

Carrying the work on a 26-ft table, a 60-ft miller takes off about 3/8-1/2 in. of stock. But the finish cut is only 0.010 in. Cutting speeds range from 25-40 ipm, the higher ranges being used for finishing. As might be expected from the size of the cut, the machine sits on 8 feet of concrete. This provides the necessary rigidity and vibration resistance. During machining, 24 sliding parallels, inserted under the cast-iron bed, furnish additional support for the work and contribute to machining accuracy. Five separate motors supply the power. (DeVlieg Machine Co.)

For more data circle No. 57 on postcard, p. 83

Cleaning Tanks

When it's fitted into the cleaning line, a new automatic preservation machine handles solvent cleaning, solvent rinse, fingerprint neutralizer, second solvent rinse and preservative application under specification MIL-P-116. The unit comes with an agitating rack. This rack has a heavy-steel grating forming its bottom, or a removable roller conveyor for conveyorized operation. Parts to be processed are loaded and unloaded flush with the machine top. This method keeps the operator's hands out of harsh solutions. It also

eliminates heavy lifting. Only one operator is required for all of the cleaning processes. (D. C. Cooper Co.)

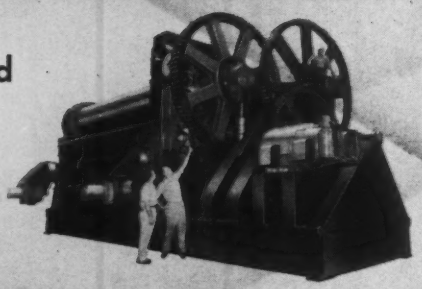
For more data circle No. 58 on postcard, p. 83

Drilling Machine

Using an 18-spindle hydraulic feed, a new lead-screw drilling machine handles auto transmissions, front-extension housings and other

INITIAL PINCH TYPE PLATE BENDING ROLL

Capacity to 6 inch plate cold



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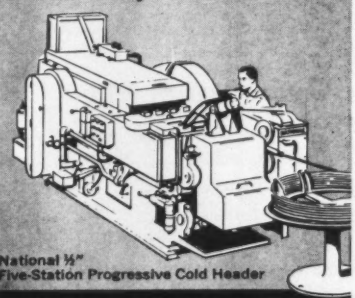
These parts are formed practically scrapless. All achieve remarkable savings over past methods.

If you make odd-shaped parts, may we help you evaluate them for cold-forming from wire? Better yet, come to Tiffin, witness our demonstrations and let's discuss your work.



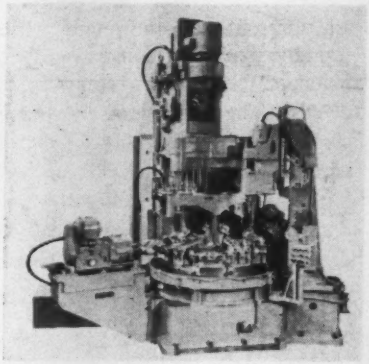
National ½" Five-Station Progressive Cold Header

NATIONAL MACHINERY CO.

TIFFIN, OHIO, U.S.A.

HARTFORD DETROIT CHICAGO

high-production parts. After the parts are loaded and clamped manually, the machine indexes and completes the entire drilling and tapping



cycle automatically. Two complete parts are finished at each index. At 80 pct efficiency, output is 45 parts per hour. (The Foote-Burt Co.)

For more data circle No. 59 on postcard, p. 83

Platform Lift

An automatic wheel stop and a throw-over bridge plate are features of an oil-hydraulic platform lift. It's 6 x 16 ft; powered by two rams. As a safety factor, the lift has an automatic rising bumper. This device is located at the rear of the platform. When the lift rises, the

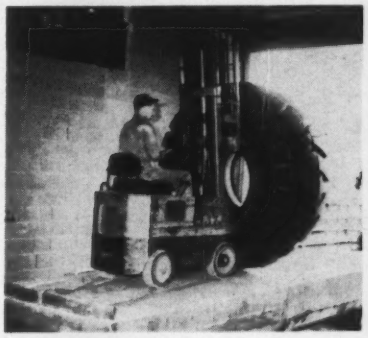


plate emerges from a slot in the platform deck and serves as a protective wheel stop. (Globe Hoist Co.)

For more data circle No. 60 on postcard, p. 83

Tool-Setting Equipment

New cross-slide and turret toolholders are part of a complete system for making chucker setups faster and easier. Here's how it saves time. All cutting tools are preset in the new holders using bench gages. But first you need dimensions for the settings. These are programmed

RESURFACED FLOORS IN PERFECT CONDITION AFTER 8 YEARS!

Permaflex solved the resurfacing problem for the Caterpillar Tractor Co., East Peoria, Illinois. Photo above shows no rutting, scaling or cracking despite great weight flooring has had to withstand over the years.

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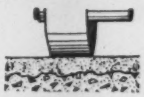

Attesting to the indestructibility of hard mastic PERMAFLEX are thousands of industrial plants, freight yards, truck terminals, railroad stations, warehouses, and shipping piers all over the U.S. Since 1918, over 100,000,000 sq. ft. of floor has been resurfaced with Permaflex. Permaflex is the original mastic . . . the only mastic capable of heavy duty! It bonds perfectly . . . never comes loose! Practically maintenance free! Permaflex is installed over old or new concrete, wood, brick or stone floors, walks or drives. Interior or exterior. A demonstration will convince you not to accept any substitute mastic (see test offer below). For if it isn't Permaflex . . . it isn't permanent!

NO DOWNTIME!

No need to move machines and stop production when you resurface with Permaflex. Floors are finished to a feather edge right up to equipment. Eliminates chipping problem! Smooth Permaflex floors are ready for foot traffic in 6 to 8 hours, heavy trucking in 24 hours, depending on drying conditions. Cost is amazingly low.

FREE LITERATURE *FREE* TEST OFFER

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on layout drawings. Thus, while the machine is producing, cutting tools are readied. When the change-over is made, the tools produce accurate parts on the very first cut. With this system, a normal 4-hour job can be tooled and ready to run in half the time. Repeat setups average 30 minutes or less. It's another step towards automatics on short runs. (Scully-Jones & Co.)

For more data circle No. 61 on postcard, p. 83

Ultrasonic Cleaner

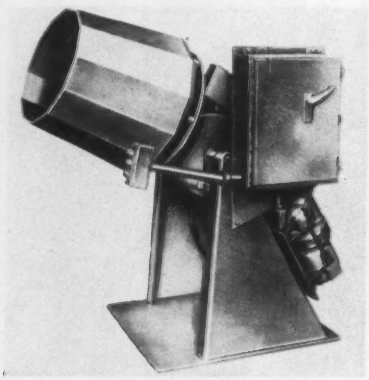
On display at the recent Armed Forces Communications and Electronics Association Convention is an ultrasonic cleaning unit which soundly scrubs parts and assemblies made of metal, glass, ceramics, or plastic. The equipment consists of a generator and a cleaning tank with an ultrasonic transducer built into its base. The generator produces high-frequency electrical energy, or sound waves. The result: After eight minutes immersion in the transducer tank, a part emerges

clean as a whistle. (Industrial Electronics Dept., Westinghouse Electric Corp.)

For more data circle No. 62 on postcard, p. 83

Barrel-Finishing Unit

Two newly improved versions of a well-known barrel-finishing unit feature safety and convenience. Both models are essentially the same, except that one has a manual tilting device while the other boasts power tilting. Either model may be fitted with a full range of barrels. Both require a minimum amount of



floor space. Work load capacities range from 500-815 lb, depending on the barrel selection. (The Baird Machine Co.)

For more data circle No. 63 on postcard, p. 83

Car-Bottom Kilns

At temperatures to 2750°F, a modernized line of car-bottom kilns suits a broad range of firing and calcining jobs. Two power packages are available in each kiln size. One is a low-power model for standard-cycle firing. The other high-power model handles accelerated firing at high temperature. (The Harper Electric Furnace Co.)

For more data circle No. 64 on postcard, p. 83

PROFITS are built on DEPENDABILITY

Improve the Quality and Appearance of your welds while you save 20% or more with Aronson POSITIONERS

A large mining equipment plant has taken another step forward with the addition of an Aronson 32,000 pound Headstock and Tailstock Positioner in its structural department for the welding of shuttle bodies and frames.

With the installation of Aronson Headstock and Tailstock Positioners the car bodies can easily be rotated into position to bring seams and weld locations in a flat or downhand position. The result is a considerable saving in time, but moreover the quality and appearance of the welds are very superior to previously unpositioned work.

These machines are designed to give long dependable service . . . and profits are Built on Dependability.

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Headstock-Tailstock Positioners • TracTred® Turning Rolls • Turntables
Fully Automatic Positioners • Geared Elevation Positioners • Magnetic Welding Clamps

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ARCADE, NEW YORK

Buildup Delayed, But Strong

The current steel market is not strong, but the forces are at work to bring on a strong buildup this autumn.

Berlin crisis has not yet the effect that it will later on. Other factors will have a delayed impact.

■ The buildup in steel through this year will be gradual. But it will be more sustained and reach a higher peak than expected.

This is based on a complex of factors that is slowing demand for August and September but will advance the recovery timetable as the year draws to a close. Predictions of close to 100 million tons of steel produced this year now seem well in hand.

Automakers Slow — Automakers are applying the brake on the late summer recovery. Setbacks of auto tonnage from August to September indicate automakers are awaiting outcome of labor negotiations. In addition, greater availability of steel for fast delivery, plus some new softness in prices, contributes to lethargy among steel buyers.

At the same time, some factors that could be expected to bring about a quick strengthening of demand are largely ignored—for the moment. These include the Berlin crisis and a potential arms buildup, possibility of price increases after Oct. 1, and the better state of general business.

Buildup to Peak—Although these factors are not getting immediate attention, they will contribute to a much stronger buildup later this year. And just when this buildup gets under way, strike hedging against the 1962 steel labor negotiations will enter the picture to strengthen demand.

Steel operations, now moving along at only about 60 pct of capacity, probably won't average more than 65 pct for the third quarter. But a figure of 75 to 80 pct for the fourth quarter is likely. Weekly rates will go well over 80 pct as the year draws to a close.

The Results—This means that delivery dates on steel will lengthen out progressively. Immediate delivery for many products, now a rule of thumb, will not be possible. A factor here will be the certainty of a strong demand from Detroit when automakers get organized after labor problems are resolved. A pent-up demand from automakers will make it tough for other users of cold-rolled, galvanized and other products when the automakers come into the market in full force.

Meanwhile, steel buyers are not being stampeded by any of these influences, either psychological or real. There is little evidence of a summer buildup as a hedge against higher prices, a national emergency, or the potential market tightening.

Prices Weak—In fact, steel prices are as soft as ever this week. At least one mill in the Detroit area is offering cold-rolled sheets at less than regular price, through agents and brokers. This doesn't mean a break in mill prices is likely, but it indicates the softness of basic prices.

This means that a lot of slack will have to come out of the market if prices are increased after the Oct. 1 increase in steey wages.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	99	96	102	89
Buffalo	79	84	84	82
Pittsburgh	88	88	86	73
Youngstown	87	89	90	82
Cleveland	99	102	122	54
Detroit	96	117	132	117
Chicago	105	107	115	84
Cincinnati	116	117	107	70
St. Louis	110	107	87	52
Southern	105	103	113	94
Western	112	117	120	82
U. S. Index	97.6	99.7	103.3	81.6

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,818	1,858	52,386	66,135
Ingot Index				
(1957-59=100)	97.6	99.7	93.7	118.3
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$37.17	$36.67	$37.17	$31.50
No. 2 bundles	$24.17	$24.17	$24.17	$21.17

PAs' Face Technical Challenge

Materials that purchasing men buy are becoming more technical and complex. And buying techniques are advancing.

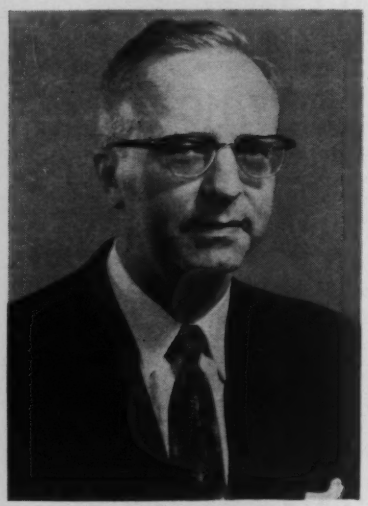
National Assn. of Purchasing Agents executive stresses need for constant study and step-by-step approach to the challenge.

■ Will tomorrow's PA have to be a mathematician or an engineer?

Probably not either. But there is a definite trend to a need for more technical knowledge in buying.

And this need is two-fold. The materials, components and parts that PAs' buy are daily becoming more complex and technical.

And buying methods are becoming more scientific. Many buyers



AHL: A technical trend.

today use mathematics-based buying formulas (example: EOQ, economic order quantity). Also, use of learning curves are almost necessary in some buying situations. Even the more complex linear programming and operations research are creeping into the procurement picture.

Broader Scope — Add to this growing technical challenge the broadening scope of purchasing—the drift to materials management—and there's the emerging picture of a new type of purchasing man.

These are the views of G. W. Howard Ahl, Executive Secretary-Treasurer of the National Assn. of Purchasing Agents. He sees a challenge clearly drawn out for present purchasing executives and those entering the field.

"Years ago," says Mr. Ahl, "it was almost the custom for companies to largely fill their purchasing vacancies with transfers from other departments. These were men who had been around a while in a company. They pretty well knew how the purchasing department operated, and they got along with people.

"But things have changed now," says the NAPA executive.

"Today, field knowledge is paramount. Buyers must know the products and processes of the companies and industries in which they operate."

Mr. Ahl points to the high incidence of chemical engineers in buying roles in the chemical industry as an example of specialized knowledge.

A Paradox—As is the story in most vocational fields today, the PA is caught in a special paradox. He needs more specialized knowledge while at the same time he must have a greater grasp of overall company methods and objectives.

"Only by constant study, and more schooling if necessary, can the individual PA meet this challenge," says Mr. Ahl. "He has to find the self-motivation, the interest and the drive."

Mr. Ahl's own background illustrates his point. He is a graduate architect. Depression fates led him into purchasing.

"Immediately," says Mr. Ahl, "I realized I lacked a lot of essential knowledge of purchasing."

He had a business management professor outline courses of study for him. And he followed through with years of study. His courses included law, economics and statistics —knowledge areas still important in purchasing.

Mr. Ahl was the top purchasing man with a major corporation when he was asked to head the NAPA staff.

Association Help—He notes that NAPA can aid purchasing men in many ways.

"The professional development program is run through local chapters. The courses and workshops they set up are in response to member needs. If an individual member feels a need for certain types of study or training he can make a request to his local officers. Many times the group can offer training or other help along the needed lines."

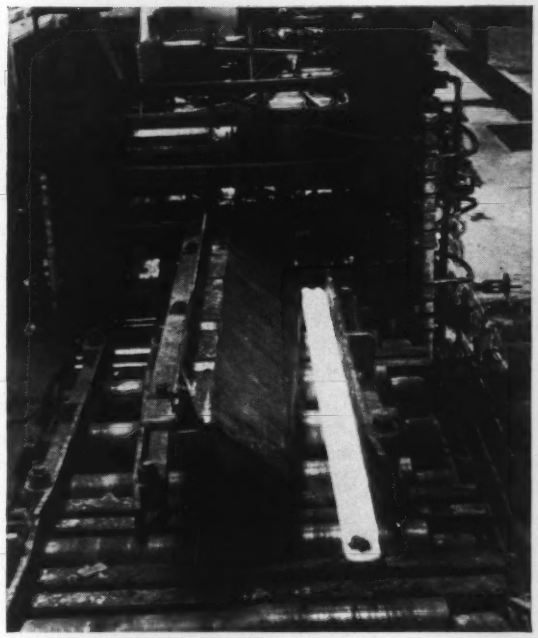
Finally, Mr. Ahl emphasizes that PAs' should not be overwhelmed by the technical challenges they face. Buyers don't have to plunge into the full maze overnight.

Step-by-Step—He stresses a step-by-step approach. For example, some 55 pct of all NAPA members represent one buyer or one-buyer-and-assistant type of operation. These men can look to flexowriter or punched card control of purchased materials. This would be a technical advance for them in buying control. These men don't have to study computers or other advanced tools. It is only necessary for them to be aware of such tools and techniques.

Mr. Ahl claims that PA's have proven their adaptability, and they will, and are now meeting head-on, the new technical challenges.

New **BIRDSBORO** mill breaks the "billet barrier"

rolls bars directly from ingots



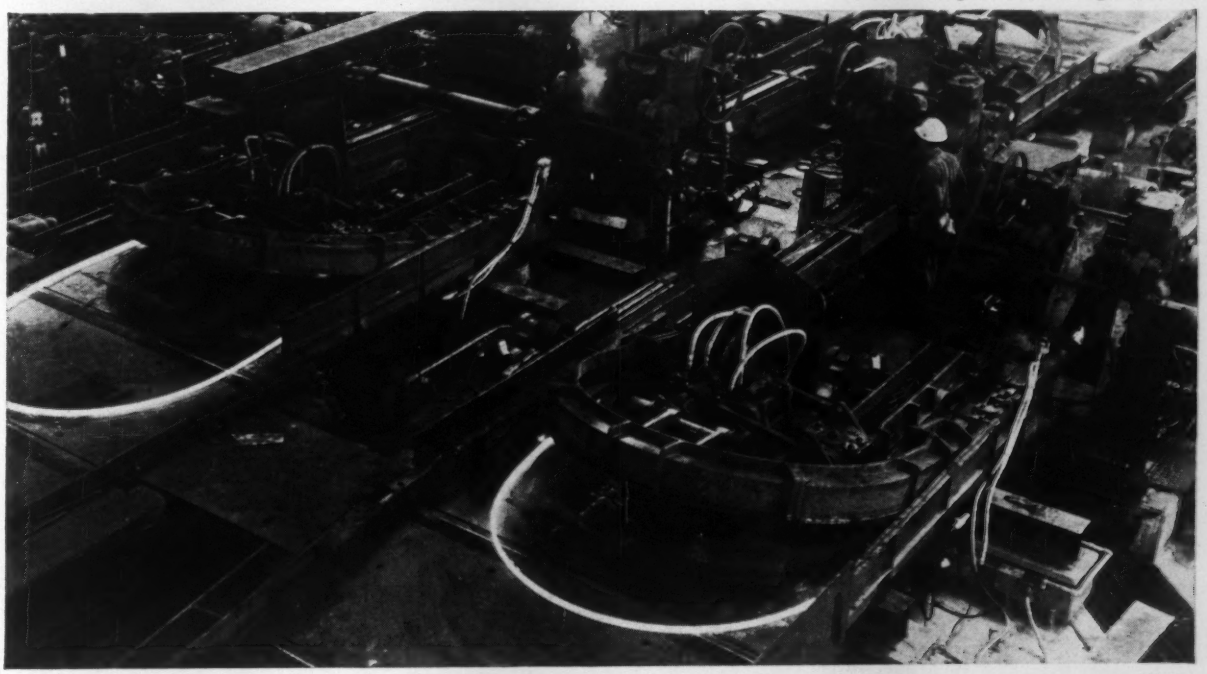
Ingot enters final pass in roughing stand

■ Bypassing the billet stage—a long-sought metal-working goal—has recently been accomplished by the Ceco Steel Products Corporation. From electric steel ingots cast billet-size, Ceco *direct rolls* finished bars on their new Birdsboro rolling mill.

The unique ingots are cast in three sizes, ranging from 322 to 990 lbs. The largest measures $7\frac{9}{16}''$ x $6\frac{9}{16}''$ x 6′; the smallest 5″ x 4″ x 5′. With these ingot sizes, the versatile Birdsboro mill produces rebars, angles, rounds and flats with a minimum of roll changes.

This 14-stand mill, the first of its kind, opens new areas of economy for many manufacturers. If you are considering new bar capacity in a plant of limited capacity, you may well be one of them. Why not call your Birdsboro representative and see? *Sales Department, Engineering Department & Mfg. Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

Reinforcing bar whips through repeaters



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BIRDSBORO

CORPORATION BIRDSBORO, PENNA.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • ROLLS • ELECTRIC STEEL CASTINGS: Carbon, Low Alloy and STAINLESS STEEL

Prices Begin Inching Upward

The end of the summer lull in the scrap market may be here. At least prices in some areas are up this week.

Most scrapmen had predicted August as the beginning of the up-swing. It could be true.

■ Strength appears to be creeping back into the scrap market. But the firming comes as no surprise to most scrapmen. They've been predicting August as the end of the summer lull.

Actually, the market has been stable all summer. Vacation schedules and auto changeovers brought the usual seasonal slump. But dealers have been keeping busy with old orders and export commitments. Now prices appear to be moving upward, though it may be too early to be significant.

Definite gains are reported in Cleveland, Cincinnati, Chicago, Pittsburgh and Philadelphia. The price of No. 1 heavy melting scrap climbed $1 in Philadelphia this week. And the $2 gap for that grade in Chicago was reduced to $1.

The IRON AGE composite price for No. 1 heavy melting is up to $37.17 this week. This is the first time in seven weeks the price has climbed. The composite price for No. 2 bundles is still $24.17.

Pittsburgh—This is a generally steady market. On a local list, automotive bundles moved up sharply, bringing nearly $3 above last month's price. However, this appears to be an isolated move. It's based, to some extent, in a reduction of the tonnage offered. The dealer market has not responded to industrial gains. A mill on the fringe of the district has come out with a price to the dealer for No. 1 heavy melting of $36. The same price was offered last month.

Chicago — New factory lists moved at stronger prices as major auto lists advanced by a little over $1. Additional mill purchases in dealer and railroad grades served to peg much of the remainder of the list at existing levels. Prices are regarded as very stable. Broker buying moved up slightly as brokers moved to fill existing mill orders. This closed the gap in No. 1 dealer steel grades.

Philadelphia—The price of No. 1 heavy melting scrap rose $1 this week. There were at least two mills in the market for this grade. And buyers found a shortage of supply in area dealers' yards. Consistent export demand is largely responsible for this. There is an undertone of strength in this market again.

New York—The market appears to be in a state of little change. Some dealers, however, say there seems to be more optimism creeping into the picture. Dealers generally say scrap, mostly for export, continues to move briskly. New orders are still a question mark. Almost all scrapmen here agree that once domestic orders pick up the market will firm in a hurry.

Detroit — The market remains firm after August industrial list deals were made this week. Some bundles brought slightly less cash than a month earlier. But export interest is evident in the city and state. Some tonnage is also being grabbed by local consumers. Several thousand tons of bundles and clips were put on the market by a source that generally doesn't offer these items.

Cleveland — Industrial lists sold between 50¢ and $1 higher than a month ago. This indicates the market is slightly stronger. Tonnage was down because of the auto changeovers. But it should hit its stride next month on new model runs. The Valley market is about the same with several mills buying electric furnace plate at $41.

Cincinnati—Area mills are in the market at $1 higher. But it's on a limited scale. Major area factory list went at $38 per ton. Dealers will sell only small amounts at present levels. Upriver markets are not buying locally.

St. Louis—A feeling of strength exists in this market. Industrial scrap is bringing more money. And there is some reaching out of the area for No. 2 bundles. Dealers are still cautious.

Birmingham—The market is still in the summer doldrums. Brokers, however, say the market is firm. They say there are indications of additional strength in everything but cast grades. And an increase in buying is expected soon.

Buffalo—Some cupola cast orders were placed this week at current levels. Dealers don't look for any demand in openhearth grades through August. Indications are for present price levels to continue.

Boston—This is still a very slow and dull market. There is very little activity at the ports. And domestic interest is nearly nil.

West Coast — Prices continue firm. One major mill is expected to buy substantial tonnage this week. Reliable sources say the Japanese will buy less in the fourth quarter than they did in the third quarter.

Houston—With orders from area mills extending through August, the market is quiet. Intake is off and brokers say the market shows signs of firming.

COMPARISON OF PRICES

(Effective July 31, 1961)

Steel prices on this page are the averages of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	July 31 1961	July 24 1961	June 26 1961	July 26 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	July 31 1961	July 24 1961	June 26 1961	July 26 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti.	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. cent per lb‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig Iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$35.50	$35.50	$36.50	$30.50
No. 1 steel, Phila. area	39.50*	38.50	38.50	33.50
No. 1 steel, Chicago	36.50*	36.00	36.50	30.50
No. 1 bundles, Detroit	35.50	35.50	35.50	27.50
Low phos., Youngstown	40.50	40.50	40.50	34.50
No. 1 mach'y cast, Pittsburgh	45.50	45.50	45.50	48.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	49.50
No. 1 mach'y cast, Chicago	47.50*	47.50	48.50	45.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$37.17*	$36.67	$37.17	$31.50
No. 2 bundles	24.17	24.17	24.17	21.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.00	31.00	31.00	33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	117.125†	115.25*	113.50	104.375
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strip.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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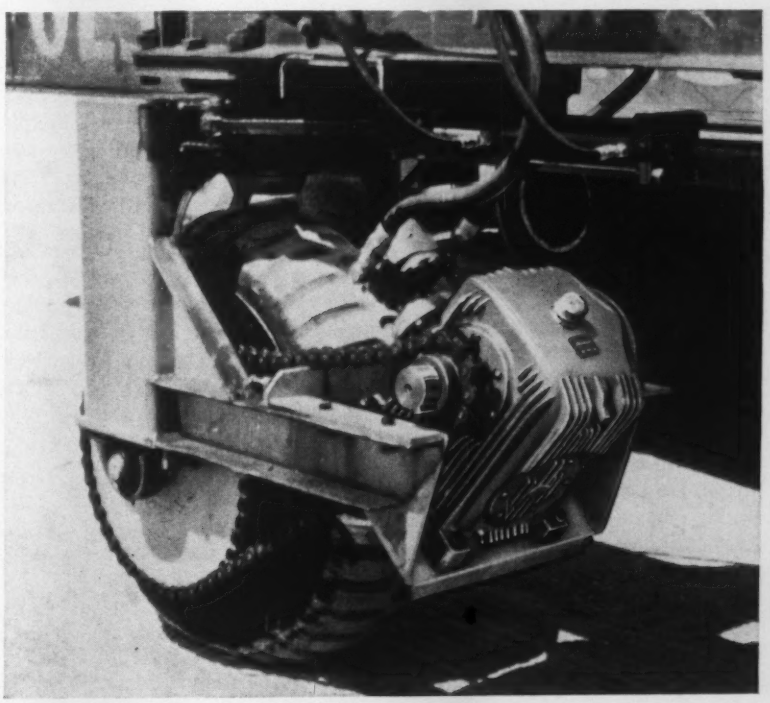
* Appears in the July 27-Aug. 10 issues.



STURGEON BAY, Wisc. Manufacturer solves drive problem for traveling crane by mounting hydraulic motor-driven speed reducer at wheel. Double-enveloping worm gear design permits compact unit necessary for application. Available from Cone-Drive Gears, Div. Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Michigan.

Warehouse Tries New Extra System

Combined pricing for hot-rolled, cold-finished, and alloy steel is offered by New England service center.

Buyers can group grades for lower quantity extras at one set of prices.

▪ An innovation in warehouse pricing—combining different grades for lower quantity extras at one set of prices—is being tried by Hawkridge Brothers Co., New England service center.

The new system, effective Aug. 7, will allow combination pricing for hot-rolled, cold-finished, and alloy steel in one order. By grouping requirements for these varied products, says Edwin Hawkridge, president of Hawkridge Brothers, customers will be able to cut their costs as much as 15 pct.

This is the first time such a pricing system has been used in New England, he notes.

Why It Started—Lee Evans, vice president of marketing for Hawkridge, gives this background on the new pricing method: Company officials started with the fact that quantity extras for different grades of steel were not the same. But cost analysis showed little or no difference in the cost of handling. In addition, one of the major items of distributor cost is delivery of steel to a customer's plant. The greater the tonnage, the lower the cost per pound.

It was decided to offer customers an opportunity to take advantage of these savings by introducing the new "profit-unit pricing."

Examples Given—Previously an order for 500 lb of cold-drawn alloy steel meant a quantity extra charge of 70¢. The quantity extra on the same amount of cold-finished carbon steel was $1.35 and on hot-rolled carbon it was $4.75.

Under the new system the 500 lb extra is $1.95 for the single item. But if bought in combination with other items, it can be as low as 75¢. In addition, all prices quoted include delivery to any point in New England so one price applies throughout the area.

Sheet and Strip—Despite some auto steel cutbacks and deferments, August auto steel orders should improve over July. September orders from automakers are coming in slowly. Unless there's an auto strike, this pace will step up later this month.

Demand for sheet and strip from non-automotive accounts is sluggish. Buyers are showing no interest in boosting inventories or worrying about possible steel price increases.

Plates and Shapes—Orders for these products are moving up—but at a painfully slow rate. For many mills, demand in July fell off from June levels. Right now, August orders look a little better than July's. Plate requirements for linepipe only amount to a trickle.

Fabricators are a little busier and this has helped the plate market to a degree. Tank fabricating is active.

Alan Wood Steel Co., Conshohocken, Pa. is shutting down its 72-in. plate mill and replacing it with a new 96-in. mill. The new mill will be in production by the end of this month.

Bars—Delays in auto steel orders are also affecting bar products. But, so far, August is shaping up as a better month than June or July.

Alloy Steel—July was the best month of the year for one large producer of alloy products. To some extent, this represented strong auto industry demand. But general demand remains strong. Orders for some of the new structural alloys are running ahead of predictions.

Service Centers—Despite distributor interest in a possible steel price rise, warehouses are making few moves to boost their inventories.

Warehouse inventories are now 2.8 million tons, down from the 3 million tons in March, according to the Steel Service Center Institute. The stocks have declined about an even 15,000 tons a month.

However, the service centers are looking for a good increase in business in the second half.

"The consensus of industry leaders is that second half sales will be 15 pct ahead of the same period last year to equal or slightly exceed the whole year's total," says Robert G. Welch, executive vice president of the Institute.

Fabricators—Shipments of fabricated structural steel during June totaled 361,159 tons, second highest month of the year, according to the American Institute of Steel Construction.

This was the second highest month of the year for shipments. However, bookings during the month fell to 297,555, down from the May figure of 391,703.

Bookings and shipments for the first six months of the year were virtually equal. Bookings totaled 1,858,825 tons; shipments 1,858,-960 tons. Shipments for the first six months were 24,000 tons higher than for the same period of 1960.

PURCHASING AGENT'S CHECKLIST

Will industrial prices head upward in the second half? P. 39

U. S. is setting up machinery to clamp controls on prices swiftly—if necessary. P. 45

Foreign orders lead machine tool upturn. P. 57

SCRAP PRICES *(Effective July 31, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs plate	43.00 to 44.00
Heavy turnings	30.00 to 31.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	50.00 to 51.00
RR specialties	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	85.00 to 90.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 39.00
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	45.00 to 46.00
Low phos. punch'gs plate, ¼ in. and heavier	44.00 to 45.00
Low phos. 2 ft and under	42.00 to 43.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	58.00 to 60.00
Rails 2 ft and under	48.00 to 49.00
Angles and splice bars	44.00 to 45.00
RR steel car axles	58.00 to 59.00
RR couplers and knuckles	43.00 to 44.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	42.00 to 43.00
Cast iron wheels	34.00 to 35.00
Malleable	46.00 to 47.00
Stove plate	36.00 to 38.00
Steel car wheels	42.00 to 43.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	105.00 to 110.00
430 bundles and solids	90.00 to 95.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	29.00 to 30.00
Low phos. 5 ft and under	43.00 to 44.00
Low phos. 2 ft punch'gs	45.00 to 46.00
Elec. furnace bundles	43.00 to 44.00
Heavy turnings	27.00 to 28.00
RR specialties	43.00 to 44.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	40.50 to 41.50
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	39.00 to 40.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	30.00 to 31.00
Drop broken cast.	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Low phos. plate	40.00 to 41.00

Cleveland

No. 1 hvy. melting	$34.50 to $35.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	34.50 to 35.50
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	22.50 to 23.50
No. 1 busheling	34.50 to 35.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	41.00 to 42.00
Low phos. punch'gs plate	36.50 to 37.50
Drop forge flashings	34.50 to 35.50
Foundry steel, 2 ft & under	34.00 to 35.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	52.00 to 53.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	39.00 to 40.00
Malleable	51.00 to 52.00
Stainless	
18-8 bundles	175.00 to 180.00
18-8 turnings	100.00 to 105.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed. bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Scrap rails, random lgth.	38.00 to 39.00
Rails 2 ft and under	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
Foundry steel, 2 ft	31.00 to 32.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.50 to 14.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	22.00 to 23.00
No. 1 RR hvy. meltings	36.00 to 37.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	44.00 to 45.00
RR specialties	40.00 to 41.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	55.00 to 56.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	43.50 to 44.50
Structural and plate, 2 ft.	42.50 to 43.50
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rail, random lgth.	41.00 to 42.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	35.00 to 36.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Machine shop turnings	5.00 to 6.00
Mixed bor. and turn.	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	32.00 to 33.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	30.00 to 31.00
Automotive cast.	39.00 to 40.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	4.00 to 4.50
Shoveling turnings	8.00 to 8.50
Clean cast. chem. borings	17.50 to 18.00
No. 1 machinery cast.	39.00 to 40.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	29.00 to 29.50

San Francisco

No. 1 hvy. melting	$41.00
No. 2 hvy. melting	38.00
No. 1 dealer bundles	28.00
No. 2 bundles	25.00
Machine shop turn.	$16.00 to 17.00
Cast iron borings	16.00 to 17.00
No. 1 cupola cast.	45.00 to 46.00

Los Angeles

No. 1 hvy. melting	$40.00
No. 2 hvy. melting	37.00
No. 1 dealer bundles	28.00
No. 2 bundles	25.00
Machine shop turn.	15.00
Shoveling turnings	15.00
Cast iron borings	15.00
Elec. furnace 1 ft and under (foundry)	50.00
No. 1 cupola cast.	46.00

Seattle

No. 1 hvy. melting	$42.00
No. 2 hvy. melting	38.00
No. 2 bundles	$25.00 to 26.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$31.00
No. 2 hvy. melting cut 3 ft and under	28.00
No. 1 dealer bundles	31.00
No. 2 bundles	23.50
Mixed steel scrap	23.00
Bush., new fact., prep'd	31.00
Bush., new fact., unprep'd	25.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	29.00
No. 2 bundles	22.00
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft & under	$44.00 to 45.00
Unstripped motor blocks	29.00 to 30.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	29.00 to 30.00

Chile Copper Plan Upsets Producers

Chile's Minister of Mines is backing a plan that worries U. S. copper companies.

It would force companies to expand by 15 pct every three years and would mean a tax on exported non-refined copper.

■ The government of Chile and U. S. copper companies with operations in Chile—Anaconda Co. and Kennecott Copper Co.—are in limited agreement.

Expansion of copper mine production and refining is in order. But the agreement ends there.

Last week, Enrique Serrano, Minister of Mines, revealed how he wants to insure Chile's goals.

May Be Impossible—There is no doubt that his plan dismays U. S. companies. Charles M. Brinkerhoff, president of Anaconda, said that it might be technically impossible to comply if the Serrano Plan becomes law.

Here's the picture on both sides.

Mr. Serrano insists that Chile is not keeping up with other copper producing centers. He points out that in 1945-49, Chile accounted for 20.8 pct of world output. Last year this dropped to 14.8 pct. And he says Chile has 27 pct of world copper reserves.

Refining Factor—Another thing that bothers Mr. Serrano: Most of Chile's copper is refined outside the country.

He says in 1945-49, 89 pct of Chile's production was refined in Chile. Last year only 42 pct was refined at home. He believes refining means jobs, and wants just about all of it done inside Chile.

He concludes it would require an expansion of about 40 pct in 10 years for Chile to maintain its current place on world markets. And to recover its 1945-49 position would require expansion of 81.5 pct.

Not Enough — Mr. Serrano weighs current expansion plans of the copper companies, and figures this isn't enough.

In the Serrano Plan, companies must expand 15 pct every 3 years. If they do not, Mr. Serrano wants a special tax to force them to conform.

The plan calls for a tax on copper exported without refining. But each company could ship 10 pct of its copper as blister, without paying the tax.

Copper Stand — Essence of the Anaconda position is that such a plan does not allow for specific operations of the copper industry. Such major expansions would require new mines.

Mr. Brinkerhoff says Anaconda has eight diamond drills searching for new ore in Chile right now. But a mine might take several years to develop. During this time no increase in production shows up on the books. But when the mine is brought in, output moves up sharply in a single move.

Other Problems—There are other technical problems.

Anaconda, in one property, is running out of oxide ores and digging more sulfides. The method of treating the ores in different. So the company must spend money for new equipment just to stay even.

This, Mr. Brinkerhoff says, deserves consideration.

Also important, he believes, is his company's past performance in Chile. From 1954 through 1960, the Anaconda president reports, world copper output moved up 45.5 pct. But Anaconda's output in Chile increased by 60 pct.

Huge Program — He also notes that the company already has almost $30 million worth of projects in mind for Chile.

Ignores Plan—Kennecott Copper Co. is concerned for another reason: The Serrano Plan ignores the $200 million Kennecott wants to invest to expand its Chile operations.

The company has been negotiating for some guarantees with the government before spending the money.

The Serrano Plan leaves Kennecott somewhat in the dark, and probably just a little concerned, about the current status of its potential program.

Tin Prices for the Week

July 25 — 115.50; July 26 — 115.625; July 27 — 116.375; July 28—117.00; July 31—117.125.*

*Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 103.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 3/8
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	52.15	52.44	52.09	56.21
Brass, Rod	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Muntz Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod..... 34.77

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be .....$ 5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots .....$ 2.25
Cadmium, del'd .....$ 1.70
Calcium, 99.9% small lots .....$ 4.55
Chromium, 99.8% metallic base ....$ 1.31
Cobalt, 97-99% (per lb) ..$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined .....$29.95 to $36.95
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9% dollars per troy oz..$ 2.25
Iridium, dollars per troy oz. ..$75 to $85
Lithium, 98% .....$9.00 to $12.00
Magnesium sticks, 10,000 lb..... 57.00
Mercury dollars per 76-lb flask f.o.b. New York .....$188 to $191
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz. .$82 to $85
Rhodium .....$137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per pg $43.00
Vanadium .....$ 3.65
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 420 ..... 30.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95.5 aluminum-silicon alloys
- 0.30 copper max. 23.75-24.25
- 0.60 copper max. 23.50-24.00

Piston alloys (No. 132 type) ..25.00-26.00
No. 12 alum. (No. 2 grade) ..21.75-22.25
108 alloy 22.25-22.75
195 alloy 24.75-25.75
13 alloy (0.60 copper max.) ..23.50-24.00
AXS-679 (1 pct zinc) 22.00-23.00

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 23.25-24.25
Grade 2—92-95% 22.00-23.00
Grade 3—90-92% 21.00-22.00
Grade 4—85-90% 20.00-21.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26¼
Yellow brass	20⅜	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19¼	18½
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 28
No. 2 copper wire 26½
Light copper 24¼
*Refining brass 25¼
Copper bearing material 24¼
*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 28
No. 2 copper wire 26½
Light copper 24¼
No. 1 composition 23
No. 1 comp. turnings 22½
Hvy yellow brass solids 18
Brass pipe 16½
Radiators 19

Aluminum

Mixed old cast. ..... 12½—13
Mixed new clips ..... 14½—15
Mixed turnings, dry ..... 13½—14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 24¼—24¾
No. 2 copper wire ..... 22¼—22¾
Light copper ..... 20 —20½
Auto radiators (unsweated). 16 —16½
No. 1 composition ..... 20½—21
No. 1 composition turnings .. 20 —20½
Cocks and faucets ..... 16½—17
Clean heavy yellow brass ... 14¼—14¾
Brass pipe ..... 16½—17
New soft brass clippings .... 18½—19
No. 1 brass rod turnings .... 16½—17

Aluminum

Alum. pistons and struts .... 7 — 7½
Aluminum crankcase ..... 9½—10
1100 (2s) aluminum clippings 12¼—12¾
Old sheet and utensils ..... 9½—10
Borings and turnings ..... 4½— 5
Industrial castings ..... 10 —10½
2020 (24s) clippings ..... 11 —11½

Zinc

New zinc clippings ..... 5 — 5¼
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1¾— 2

Nickel and Monel

Pure nickel clippings ..... 56 —58
Clean nickel turnings 43
Nickel anodes ..... 56 —58
Nickel rod ends ..... 56 —58
New Monel clippings ..... 26 —26½
Clean Monel turnings ..... 18½—19
Old sheet Monel ..... 25 —25½
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

Lead

Soft scrap lead ..... 7¼— 7½
Battery plates (dry) ..... 3 — 3¼
Batteries, acid free ..... 2 — 2¼

Miscellaneous

Block tin ..... 90 —92
No. 1 pewter ..... 65 —67
Auto babbitt ..... 46 —47
Mixed common babbitt ..... 10 —10½
Solder joints ..... 15 —15½
Small foundry type ..... 9 — 9½
Monotype ..... 9¼— 9¾
Lino. and stereotype ..... 8½— 8¾
Electrotype ..... 8 — 8¼
Hand picked type shells .... 5¾— 6¼
Lino. and stereo. dross ..... 1¾— 2¼
Electro dross ..... 2½— 3

(Effective July 31, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$80.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras

(Effective July 31, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes[▲] *1.25*-lb. base box	Electro[▲▲] *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ▲ COKES: 1.50-lb. add 25¢. ▲▲ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*			Hollowware Enameling 29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.		
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective July 31, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*		7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective July 31, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.16	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	18.84	16.65	22 94	22 19
Boston**	.10	10.00	10.50	11.62	12.50	9.95	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.48	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	7.91	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.10	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.67	12.85	18 59	16 68	22 69	21 04
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.59
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.60	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.68	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.95	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective July 31, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	71.00†
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	73.00
Lyles, Tenn. *T3*	.....	.....	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31–0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01–15.50), $101.00; Keokuk (14.01–14.50), $89.00; (15.51–16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective July 31, 1961)

STAINLESS STEEL

Base price cents per lb. f.o.b. mill[1]

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A5;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R5;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $280 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead

THE DYKEM COMPANY
2303G North 11th St. • St. Louis 6, Mo.

CUT SCRAPER TIME
END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

THE DYKEM CO., 2303G NORTH 11TH ST., ST. LOUIS 6, MO.

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

ELECTRIC FURNACE STEEL CASTINGS

are engineered to *YOUR* specific requirements

"C" steel castings are CLEAN steel castings of uniform structure that will minimize machining and assembly costs, permit of greater freedom and efficiency of design and add to your product the recognized strength, endurance and desirability of steel. C steel castings, foundry engineered from pattern to finished casting can be had in

CARBON, ALLOY OR STAINLESS STEEL
SAND OR SHELL MOULDED

The technical experience and knowledge of our engineering staff are at your service. Write, phone, or call.

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LANSDOWNE 1, PENNA.

FERROALLOY PRICES

NOTE: Prices of Boiler Tubes, Clad Steel, C-R Spring Steel, Electrical Sheets, Electrodes, Electroplating Supplies, Metal Powders, Rails and Track Supplies, and Refractories are published in alternate issues.

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	33.25
0.05% C....	34.00	1.00% C....	33.00
0.10% C....	33.75	1.50% C....	32.75
0.20% C....	33.50	2.00% C....	32.50

3-5% C, 53-63% Cr, 2.5% max. Si... 26.00
4-6% C, 58-63% Cr, 3-6% Si..... 22.50
5-8% C, 58-63% Cr, 3-6% Si..... 22.50
6-8% C, 50-56% Cr, 4-7% Si..... 22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si.. 28.75
0.025% C (Simplex) 31.50
0.010% C max, 63-66% Cr, 5-7% Si. 32.50
0.010% C max, 68-71% Cr, 2% Si max 31.50
0.25% C max 33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	22.50	14.60
Ton lots	30.45	16.05
Less ton lots	33.40	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 13.70
Ton lots packed in bags 16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, 35 lb, pig	down	Neville Is., Pa. 35 lb
16-19%	.. $98.00	$96.00	$100.50
19-21%	.. 100.00	98.00	102.50
21-23%	.. 102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads, bulk 34.25
Ton lots, palletized 36.25
250 to 1999 lb 39.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	(Bulk) 37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.
Carloads bulk 11.60
Ton lots, packed 13.25
Carloads, bulk, delivered, per lb of briquet 14.00
Briquets, packed pallets, 2000 lb up to carloads 16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe ..	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	13.50	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb...	2.40	3.30	4.55

(Effective July 31, 1961)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.
Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, del'd per lb con't Cb
Ton lots $3.45
Less ton lots 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Vanadis, O., freight allowed, ton lots, per lb contained Ti $1.35
Less ton lots (200 lb and up) $1.37

Ferrotitanium, 30% low carbon, 0.10% C max., 27-32% Ti, Vanadis, O., freight allowed, per lb contained Ti, ton lots $1.35
Less ton lots (200 lb and up) $1.40

Ferrotitanium, 1-3% Carbon, 17-20% Ti, f.o.b. shipping point, freight allowed, carload per net ton $250.00
Ton lots $260.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered ..... $2.45 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

Announcing... IRON AGE METALWORKING INTERNATIONAL

A NEW and completely DIFFERENT kind of publication! NOT just another United States business magazine extending its circulation into other countries, but a truly international, multi-lingual business publication for metalworking and metal-producing executives throughout the world.

First issue: January 1962.

EDITORIAL

● **Objective:** To provide a full international exchange of information relating to new developments and technology on metalworking processes, equipment and materials, as well as coverage of business and economic news.

● **Staff:** A full-time editorial staff in the United States and abroad will devote its entire efforts to the international publication, backed up by qualified correspondents in 18 metalworking centers throughout the world.

● **Content:** Editorial content and balance will be guided by continuing surveys of informational requirements and preferences among key executives in metalworking companies in the countries served. Full text editorial material will be in English, with digests in German, French and Spanish.

● **Format:** The new monthly publication is uniquely suitable for effective presentation and convenient reference, from the English full-text to the German, French and Spanish digests. Square format with publication trim size 11 x 11¼, four column makeup, will provide a 7 x 10 editorial page plus one column for a multi-lingual digest. This format will also accommodate a 7 x 10 advertisement plus multi-lingual digest of the copy. New product items will be keyed and a reader service postcard provided for new products as well as advertising.

THE READER

In most cases, the reader of IRON AGE METALWORKING INTERNATIONAL will be the chief technical executive of the metalworking plant. Typically, he will be responsible for both engineering and production and will have a key role in major purchasing decisions. In larger plants, where work is dispersed among a greater number of executives, IRON AGE METALWORKING INTERNATIONAL's readers will be in four basic functions: administration, engineering, production and purchasing.

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Over 15,000 plants covering every market in proportion to its *immediate* potential, including—

The European Common Market
The Free Trade Association
The British Commonwealth
Central and South America
Japan, India, Africa
The Near East and Asia

Penetrates every segment of metalworking and metal-producing, including—

Ordnance
Metal Furniture
Primary Metals
Fabricated Metal Products
Machinery
Transportation Equipment
Instruments

AND FOR ADVERTISERS

● **Inquiry processing service:** All advertisements will be keyed — reader service card will be bound into IRON AGE METALWORKING INTERNATIONAL. Instructions on reader service card to be printed in four languages: English, German, French and Spanish. Postage to be paid by the inquiring reader.

● Marketing information.

● Copy translation assistance.

Your IRON AGE representative is ready to give you a preview, including full details and a pilot issue. Call him now.

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EST. 1904
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PIPE SUPPLY CO., INC.
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Seamless and Welded ⅛" to 26" O.D.
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging —
Fittings — Valves.
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50th St. & 2nd Ave., B'klyn 32, N.Y.

AVAILABLE IMMEDIATELY

1—COMPLETE BAR MILL. 16" Breakdown and 6-Stand 10" United Mill with 900 Rolls, Re-Heat Furnace, 110 Ft. Hot Bed Shears, Tilting Table & Cradles, Roll Shop. Main Motors 2200 volt AC current

1—15-Ton Top Charge Electric Furnace. 4000 KVA Transformer, 13,800 volts

20—8" Dia. x 4"/6"/8" Face 2-Hi Cold Mills with 25 H.P. Motors 230 v. DC. Edge Rollers, Coilers, etc.—complete

2—10" Dia. x 10"/16" Face 2-Hi Cold Mills with 40/65 H.P. Motors 230 volts DC. Edge Rollers, Coilers, etc.—complete

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PITTSBURGH 22, PENNSYLVANIA

GOOD USED MACHINERY
AUTOMATIC, 3¾" Model A Cleveland, sgl. spdl.
BORER, No. 47A Heald, SE, hyd. Boromatic
BROACHES, 10 ton 60 St. Model 10-60SRV Lapointe hyd. sgl. ram vert. surf.
DRILL, 20" No. 217 Baker Bros. box column, hy. dy.
DRILL, W. F. & John Barnes Model 420, horiz., deep hole
DRILL, 36 spdl. No. 4 BL Natco, adj. multi spdl., hyd.
DRILL, 4'-13" col. Carlton radial, MD
DRILL, 24" No. 3 Allen 3 spdl., sensitive
DRILL, 22" No. 221½ Barnes, box col., upright, new '52
DRILL, 5 spdl. Allen Mod 3VCCE, auto., 6 sta., rot'y, new '54
GEAR GEN., 12" Gleason str. bevel gear hyd.
GEAR HOBBER, 8" x 9" Model 7A Lees Bradner, '52
GEAR GEN., No. 5B Sykes or Farrel Birmingham herringbone
GRINDER, Centerless, No. 4 Cincinnati Filmatic brg.
GRINDER, Centerless, No. 12 Landis, hyd., microspheres brg.
GRINDER, Cyl., 6" x 18" Cincinnati Type ER, pl. hyd., Filmatic brg.
GRINDER, Int., No. 81 Heald Sizematic, hyd.
GRINDER, Int., Model 1120Y Bryant, pl. hyd.
GRINDER, Surf., 8" x 24" No. 3S Abrasive, hard ways
GRINDER, Surf. 30" No. 16 Blanchard rot'y surf.
GRINDER, Cincinnati Monoset cutter and tool
GRINDER, Thread, 6" x 15" Model TG615 J&L auto.
GRINDER, Thread, 6" x 36" Model TG636 J&L auto. (2)
HONE, 705-2 Micromatic, 2 spdl. vert. hyd., new 55
IRONWORKER, No. 1½ Buffalo Universal cope & notching
LAPPER, No. 821-8 Micromatic "Microflat," new '53.
LATHE, Model 10x72" Sundstrand center drive auto.
LATHE, 12"x22" Model 12 Sundstrand auto. stub
LATHE, 16"x30" Monarch Type CY toolroom, hard ways
LATHE, 25"x72" cc Axelson grd. bd., 20 HP flanged MD
LATHE, 20"x90" cc LeBlond, grd. bd., prod.
LATHE, 1" No. 2 Warner & Swasey ram type turret
LATHE, 36" Rogers Model 1T-36 Vti. turret lathe, new '53
LATHE, Mod. 4D Potter & Johnston, HS, auto., hard ways

OVER 1,000 NEW AND USED MACHINE TOOLS IN STOCK
WRITE FOR LATEST STOCK LIST
MILES MACHINERY COMPANY
2041 EAST GENESEE • SAGINAW, MICH. PL. 2-3105

Foundry Tool Sales Are Picking Up

Used foundry machine dealers have suffered from the same sales lag in recent months as dealers in other used machinery.

But now sales are beginning to pick up. Most of these dealers are definitely optimistic.

■ The reconditioning and selling of used foundry and heat treating equipment is a relatively unknown phase of the used tool business. And, like the larger used machinery field, it's just starting to emerge from its own recession.

Fred D. Richman, president, AAA Machinery & Equipment Co. of Cleveland, notes: "Used foundry equipment has been pretty spotty for some time. But we are making a few more sales now based on inquiries of four or five months ago.

"Our new inquiries are still coming in strong. So we are confident things will move up. Heat treating equipment is doing relatively better simply because it is in a period of major growth. This is due to the new high strength alloys coming out and new designs to utilize them for weight-saving."

Good Selections—Mr. Richman says selection of good used equipment "will never be better." He adds that "prices are now attractive."

AAA has about 400,000 sq ft of storage space in Cleveland. This makes it probably the largest of its type in the U. S. In fact, there are only three or four other major suppliers of this type used machinery in the country.

Hottest items now are sand mullers and molding machines made in the 1950's. Molding machines come in a variety of sizes. Other major equipment includes melting tools, furnaces, cleaning equipment, and grinding machines.

Most of these items sell at about 30 pct to 55 pct of the cost of new equipment.

Source—Major sources of these tools are foundries being liquidated and government surplus stock. AAA buys equipment from a liquidation outright for its own account. The price is fixed and the machine sold on the premises.

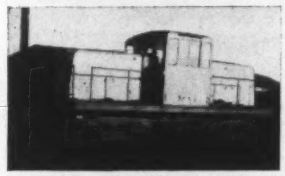
Direct liquidation auctions are also common, of course. Because used foundry machinery dealers are so few, and foundries so scattered, long-distance business is quite common. AAA has sold all over the United States through local sales agents. It has also done business in Canada, Mexico, India, South America and Australia. Little is sold in Europe because new equipment there is priced about 30 pct under competitive new U. S. tools.

"I don't like the way Peabody is responding to the challenge of his increased work load."

LIQUIDATION PLATE ROLLING MILL

Mill Facility, Equipment and Material of the former Phoenix Steel Corp. Plant located at Harrisburg, Penna.

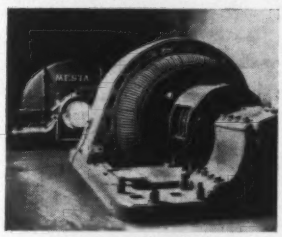
LOCOMOTIVES



80 Ton Gen. Electric Diesel-Electric Locomotive

(1) 80 Ton GE Diesel Electric Std. Ga. 1953
(1) 50 Ton GE Diesel Electric Std. Ga. 1948
(1) 20 Ton Plymouth Diesel 36" Ga. Cummins
(1) 20 Ton Plymouth Gasoline 36" Ga. LeRoi

MILL DRIVE



3000 HP General Electric Slip Ring Motor Reduction Gear Mill Drive 78 RPM OUTPUT

(1) 3,000 HP General Electric Slip Ring Motor, 2,300 Volt, 60 Cy., 3 PH., 356 RPM with Comp. panel, and lub. system, air wash sys. Coupled to Mesta 4.6:1 Red. Gear-output speed 78 RPM.

OVERHEAD TRAVELLING CRANES

(1)	150 Ton/40 Ton	Morgan	Ladle Crane 59'-8" Span
(1)	100 Ton/25 Ton	Wellman	Ladle Crane 59'-6" Span
(1)	40/25 Ton	Milwaukee	Crane (1951) 59'-6" Span
(1)	25 Ton	Milwaukee	Crane (1949) 68'-0" Span
(1)	20 Ton	Milwaukee	Crane 69'-4" Span
(2)	20/5 Ton	Shaw Box	Crane 65'-0" Span
(1)	20 Ton	Milwaukee	Crane (1949) 46'-10" Span
(1)	15 Ton	Northern	Crane 69'-4" Span
(2)	15 Ton	Morgan	Crane 64'-6" Span
(1)	10 Ton	Alliance	Crane 70'-0" Span
(1)	10 Ton	P & H	Crane 69'-4" Span
(1)	10 Ton	Shaw Box	Crane 69"-4' Span
(1)	10 Ton	Shaw Box	Crane 64'-6" Span
(1)	10 Ton	Alliance	Crane 64'-6" Span
(1)	10 Ton	Milwaukee	Crane 65'-0" Span
(2)	10 Ton	Alliance	Crane 60'-0" Span
(4)	10 Ton	Alliance	Crane 56'-6" Span
(1)	5 Ton	Alliance	Crane 64'-6" Span
(2)	5 Ton	Alliance	Crane 61'-6" Span
(1)	5 Ton	Cleveland	Crane 56'-6" Span
(1)	5 Ton	Northern	Crane 44'-6" Span
(2)	5 Ton	Alliance	Crane 40'-4½" Span
(1)	5 Ton	Phoenix Stl	Crane 35'-0" Span
(1)	15 Ton	Milwaukee	Bridge Only (1949) 70'-0" Span

Spare Trolley's, 5 ton, 10 ton 15 ton; contractor panels; cab controls; Resistance banks.

ROLL LATHES

(1) Pond—60" Face Plate; 41'-6"Centers; 12' tool holder; with floor plate milling att.
(1) Fifield—60" Face Plate 14'-0" Centers with floor plate milling attach.
(1) Garrison—40" Face Plate; 12'-8" Tool Holder; 12' Centers; 10 HP Drive

ROLLING MILL EQUIPMENT

43" Edger Mill—Pemco—72"x18" Billet —1000 H.P.

SLAB EDGER MILL

(1) Slab Edger Mill, Pittsburgh Engr. Co., S/N 48147 (New 1949). Capacity 72" x 18" thick slab, Roll Size (2) 43" Diameter x 24" Working Surface-Alloy Steel. Motor Drive 1,000 HP & reduction gear. Complete with starter, Controls, Etc. (1) MG Set, General Electric, 1,000 KW, Generator-600 V DC 1667 Amperes. Motor-1,400 HP 2300/3/60.

(1) Birdsboro 34" Blooming and Slabbing Mill, 72" Wide, 2 High, Reversing, 28" x 86" Ingot, Minimum Thickness 2", Maximum Lift 28", Maximum Ingot Weight 30,000# (Approx.), Approach Table 38' Long, Runout Table 26' Long. Both Tables Motor Driven 50 HP 230 V DC; Hydraulic Slab Shear, Pittsburgh Engr. Co., S/N 48148, New 1949; Capacity 1,000 Tons, 6" Thick x 60" Wide Steel Slab (Hot); Hydraulic Pump, 8 Stage Bingham, 500 gpm @ 1,440 psi, Motor Drive—600 HP 2,300/3/60, Starter, Controls, Etc.

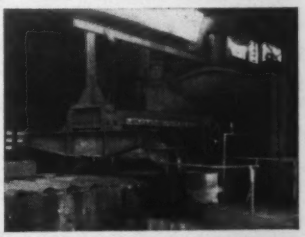
(1) Birdsboro 126" Plate Rolling Mill, 126" Wide, 3 High, 34" Dia. Rolls, 15" Maximum Lift, Minimum Thickness 3/16", Maximum Slab or Ingot Size 115" Wide x 15" Thick, Maximum Weight 22,000# (Approx.). Tilting Tables, Front and Back; 3,000 HP Electric Motor Mill Drive. Runout Table 54' Long to Plate Leveller; Plate Leveller, 11 Driven Rolls, (5 Upper and 4 Lower), 148" Between Housings. Motor Drive—50 HP 230 V DC.

(1) Birdsboro 89" Plate Rolling Mill, 89" Wide, 3 High, 25½" Dia. Rolls, 15" Maximum Lift, Minimum Thickness 3/16", Maximum Slab or Ingot Width 72", Maximum Weight 4,400# (Approx). Tilting tables Front and Back; Runout Table 45' Long to Plate Levellers; 2 Plate Levellers, 6 Upper and 5 Lower Work Rolls. Motor Drive—55 HP 230 V DC.

(1) Birdsboro 42" Universal Plate Rolling Mill, 2 High, Reversing, Maximum Lift 26", Maximum Width 42", Minimum Width 7", Minimum Thickness ¼", Maximum Weight 14,000# Ingot (Approx.). Vertical Side Rolls each Side of Mill Housings for Rolling Plate Width, Front Mill Table 45' Long, Back Mill Table 33' to Plate Leveller; Plate Leveller, 9 Work Rolls (4 Upper and 5 Lower), Motor Drive 75 HP 230 V DC. Plate Shear, 48" x 2" Thick (Cold), Motor Drive 50 HP 230 V DC.

EDGE TRIMMING AND SLITTING SHEAR

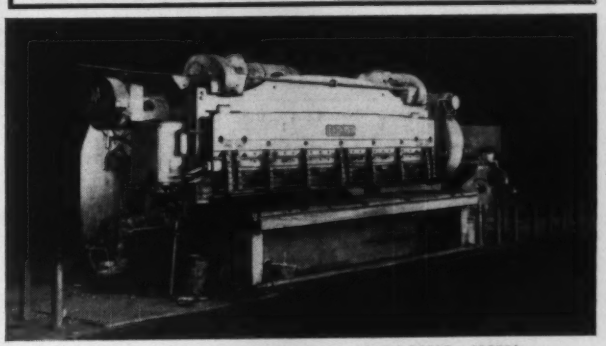
Capacity 96" wide x 7/16" thick plate. Arbor 12" diameter, circular cutters 16" diameter x 2⅝" face. Cutting speed adjust to 62 fpm. Drive 65 HP, 250/1000 RPM, 230 volt, DC., with operator's pulpit, controls, etc. Mfd. by Monarch Tool & Die Co., Milwaukee 1949. Approx. wt. 80,000#.



1000 Ton Pemco Hot Slab Shear

SHEARS

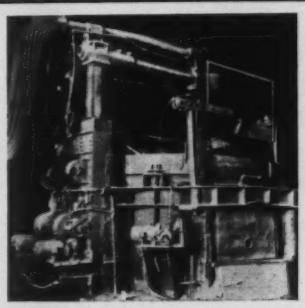
1,000 Ton HOT UPCUT SLAB SHEAR Capacity 6" thick x 60" wide, stroke 12½", 8 cuts per min., 32" hyd. hold down cylinder, 1320# w.p., 600 HP Bingham Pump and motor drive. Auto. Length of cut gauge, adj. from 30"/120" length of cut. Approach and runout tables, crop kickoff, operator pulpit, relate and control panels. Man. Pittsburgh Engineering and Machine Co.—1949.

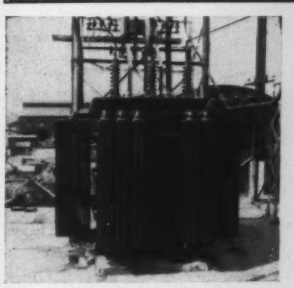


1" x 12' Cincinnati Plate Shear **Model 10012—(1951)**

ELECTRIC ARC MELTING FURNACE

HEROULT Model 15 Electric Arc Melting Furnace. Shell Diameter 14'-0"; Inside Diameter 12'-0" Side Charge. Cold scrap charge 30,000# /40,000#. Electrode size 14" diameter x 60" long. Transformer General Electric 6000 KVA Primary Voltage 13,200/25,400, Sec. 265/92 volts; built in reactor. GE Automatic Control Panel. Westinghouse tot. encl. drawout switchgear. With approx. 160 spare electrodes and nipples, door frames, rings, motors, etc. S/N 236 Mfd. Heroult Div. U. S. Steel Corp.





TRANSFORMERS

(1) 7500KVA Wstghse 66000 Pri. 13800 Sec 3 PH 60 S/N 4089566 Yr. 1948
(3) 2000KVA GE 13200/26400 Pri 2400/4150Y, Sec. 1 PH 60 S/N 2871432; 2871433; 2871440
(3) 667KVA GE 2300/4000Y Pri 460 Sec 1 PH 60 S/N 4497213; 4497214; 4497215
(3) 167 KVA GE 2400/4160Y Sec 240/480-60 CY 1 PH Sn. C 381487-56P 88-00. Rebuilt
(3) 150 KVA Wstghse 2400/4160Y Pri 120/240 Sec 1 PH 60 S/N 4396362; 4399370; 4399371
(1) 25KVA GE 1100/2200 Pri 120/240 Sec 1 PH 60 S/N 1371094
(1) 25 KVA Wstghse 2200 Pri 220/110 Sec 1 PH 60 S/N 385970
(1) 25 KVA Wstghse 2300 Pri 230/115 Sec 1 PH 60 S/N 1406895
(3) 175 KVA GE 2400/2160 Pri 208/101 Sec. 1 PH 60 S/N 152339; 152340; 152341

METALLURGICAL HOT BLAST CUPOLA

Rated 15/20 tons/hr. Shell dia 8'-11"; hearth dia 7'0"; stack height 40' (12) water cooled tuyeres 3.81" dia. Heat exchanger for preheating 12,000 CFM to 950/1000° F. with Allis Chalmers blowers, motors, controls. Charging equipment, cyclone dust collector, piping, valves, operating and control instrumentation. Installed 1954.

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DIAMETER OF RAM 62"
STROKE OF RAM 40"
2—17" DIA PULLBACKS
MOVING DOWN TYPE
WITH INTENSIFIER
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30 Ton Ohio Diesel Locomotive Cranes, excellent condition, BARGAINS, Terms & Rentals. Orton, Americans available . . . 44 and 45 T. G.E., Whitcomb & others. Diesel Elec. Locomotives.

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EDison 4-9471-2

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—35" 2-HIGH BLOOMING MILL, with reversing motor, M.G. set, tables, manipulator.
1—3-HIGH PLATE MILL, 40" & 28½" x 112".
1—32" & 20" x 56" 3-HIGH SHEET MILL with motor driven screwdown and pre-set controls.
1—25" & 42" x 66" HOT STRIP MILL, 4-high.
4—29" 2-HIGH HOT SHEET MILLS, with tables.
1—16" x 28" COLD MILL, 2-high, 200 HP drive.
1—26" COLD SHEET MILL TRAIN 5 stands.
2—12" x 18" 2-HIGH COLD MILL, 150 HP DC. drive.
2—10" x 14" 2-HIGH COLD MILLS, 100 HP DC drives, with one coiler.
1—8" x 12" 2-HIGH COLD MILL, 50 HP motor.
1—3½" & 8½" x 5½" STRIP MILL, 4-high
1—16" BAR MILL, 3-high, single stand.
1—9" BAR MILL, 3-high, five stands.
3—HOT STRIP DOWNCOILERS, for widths up to 75", max. coil diameter 54".
1—VERTICAL OPEN-SIDE BAR SHEAR, 28" knife, capacity 1" x 24" or equal.
2—SQUARING SHEARS for ¼" x 156" sheets.
2—SQUARING SHEARS for 10 ga. x 120" sheets.
4—LEVELLERS for sheets, 17 rolls, widths 24", 42", 48", 66". ROLLS 4" DIAM.
1—AUTOMATIC SQUARING SHEAR UNIT for sheets, 182" side cut, 72" end cut.
1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 40" dia. rolls.
1—CORRUGATING MACHINE for sheets 144' long, 3 sets of removable dies.
1—42" WIDE COIL BUILD-UP LINE.
1—POINTER, tube 2" O.D. x ¼" wall maximum.
1—1500 HP GEAR DRIVE, ratio 8 to 1.
1—1200 HP GEAR DRIVE, 295 to 30 RPM.
1—400 HP GEAR DRIVE, 8.2 to 1 ratio.
1—1500 HP MOTOR, 2300 volts, 3 phase, 60 cycle, 240 RPM.
1—600 HP MOTOR, 2300/4600 volts, 3-phase, 60 cycle, 450 RPM.
1—175 TON HOT METAL CRANE, 54' SPAN, 4 GIRDERS.
1—75-TON HOT METAL CRANE, 58' SPAN, 4 GIRDERS.

COMPLETE MECHANIZED SHEET MILL CONSISTING OF CONTINUOUS FURNACES, 3-HIGH ROUGHING STANDS, 2-HIGH FINISHING STANDS, MILL TABLES, DOUBLERS, COLD MILLS, LEVELLERS, SHEARS, ANNEALLING FURNACE, MECHANICAL PACK OPENER, ROLL LATHE.

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SHEAR, BAR

TYPE FV75 PELS BILLET SHEAR

Solid bars 7⅜" Squares 7"
Plates 12" x 4⅛" 16" x 3½"
18" Blades 6" Stroke
65,000# PSI T.S. Clutch Operated
Good Condition In Stock

LANG MACHINERY COMPANY, INC.

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GRant 1-3594

6' x 10 Ga. Niagara Power Shear.
No. 3 Niagara Angle Bending Roll, M.D.
6" x 6" x 1" Cleveland Double Angle Shear.
6' x ⅜" Cincinnati Power Press Brake
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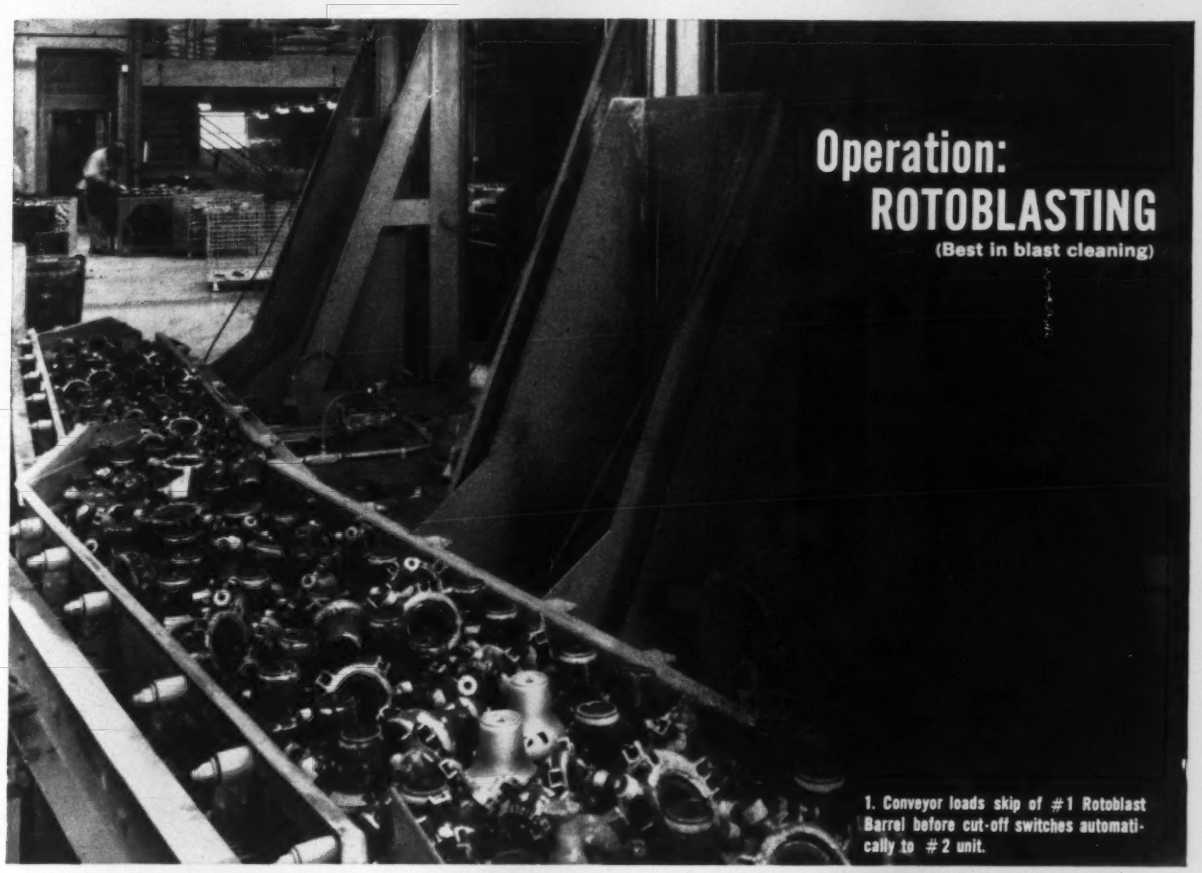

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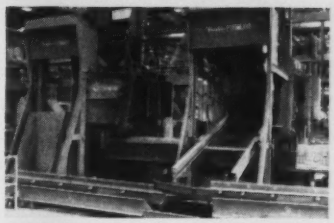
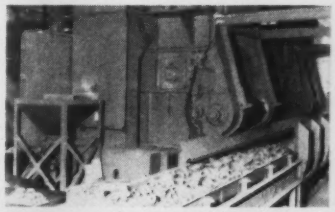


2. Skip fills second unit with exact pre-determined load for cleaning.



3. Cleaned castings move on take-away conveyor to next operation.

4. Before and after Rotoblasting. Note core sand and rods in uncleaned piece.

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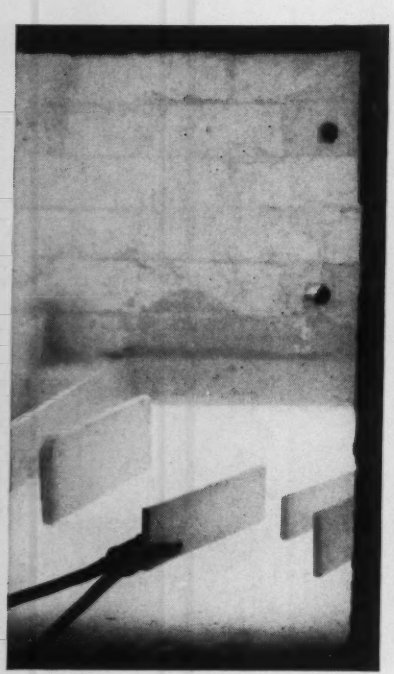

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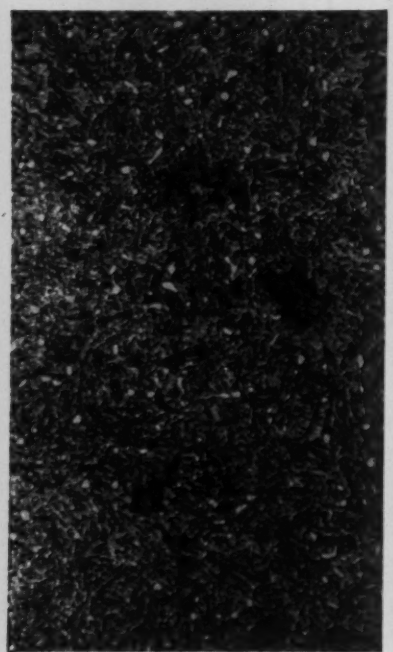

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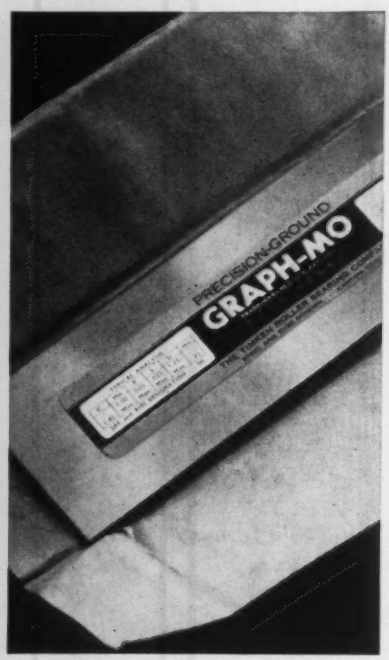

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